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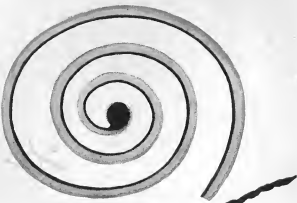
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CITY OF THE PHOENIX

by M. C. Pease



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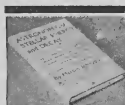
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AUGUST, 1951

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REALITY

Man's a unique sort of critter, here on this planet. He has a lot of faults, a lot of failings, but he seems to be headed for some place out of this world—the neighboring planets right now, and further than that a bit later on. And there's a lot of confusion and trouble and bumbling.

The psychiatrist says: "You have to face reality; you must understand the real world, face it, and adjust yourself to it." May I invite you to stop facing reality, refuse to adjust yourself to it, and take that reality firmly by its jackass stubborn ears and turn it around so it is forced to face you?

Let's consider reality; the reality—as every animal but man well knows—that the night is dark and cold and the rain-wind is penetrating, while dangerous carnivores are seeking warm flesh for food. Man, insane creature that he is, doesn't face reality—he doesn't adjust himself to it, as does the Arctic fox with a warm, white coat of fur in winter and a short brown coat in summer. Man doesn't face the reality of the night—he lives in

a steam-heated, electrically-lighted house, and watches, via television, something that happened ten years ago and a thousand miles away. And Heaven help the carnivore that doesn't know better than to come Man's way—there's a high-power rifle waiting for him.

You've got to face reality, and adjust yourself to it. You've got to give up, and let the cockeyed world overwhelm you; you mustn't look it in the eye, recognize it for an unreasonable system of traditional stupidities, and kick it into shape. Don't attempt to alter the world; submit to it. George Washington was unsane; he didn't face the reality of the world and adjust himself to it—he kicked its teeth in till it was a little more sane.

Jefferson must have been a bit off the proper beam, too; he had a lot to do with setting up a completely new system of thinking. He was obviously a man poorly adjusted to the world as it was—but he had the courage and determination to adjust the world, and not submit to being adjusted himself.

Right now, man is facing the reality that he can't have the Moon; a good many of us are considerably irked with that reality, and are making very determined motions toward forcing that reality to face Man. The concept that Man must face reality is a concept of defeatism; the right answer is to take a good, hard look at reality, measure it carefully, estimate the exact size and power of jacks needed to lift it around, and then go to work changing it.

The more people you have in a nation who refuse to face reality, and insist that reality should be made to face them, the more free and happy that people will be. The slave mentality that faces reality and adjusts to it leads to totalitarianism, where a few determined men who won't accept the order of things take over the millions who will. Man could inhabit this Earth for a million years, facing reality and getting not much of anywhere. But a few determined reality-twisters can build a civilization—and did.

There are always some men to whom the statement "You can't—" is a challenge. They'll grunt in irri-

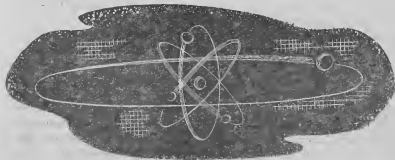
tation, and mutter under their breath "No—not yet!" and start turning the most deadly weapon in the universe against that challenge—concentrated thought. "Rockets are toys, you can't build a rocket ship." "Yet! (But let's see what exhaust velocity we'd need—)"

Basically, Man seems to produce two types, with a spectrum ranging between. There's the pure pastoral type, that faces reality and accepts it. And there's the other type that faces reality and accepts it—as a challenge!

The reality so far is that we can't reach the planets—yet!—or the stars—there *must* be some way to crack the speed of light!—but the greater reality is that Man doesn't believe in adjusting himself to the world as it is. He has, with vigor, vim, and joy taken the world as it is and adjusted the cockeyed thing to himself.

Given half a chance—and a little restraint in the matter of using atomic bombs—he'll adjust the Universe, too! If he doesn't do that, he'll stop being Man.

THE EDITOR.



CITY OF THE PHOENIX

BY M. C. PEASE

The first expedition found the City; the City had the weapon that could turn the encroaching invaders. But where in the City was that knowledge.

Illustrated by van Dongen

The ship lay quiet in space. The star for which it served as base was bright but, to the naked eye, too far off to be more than a star.

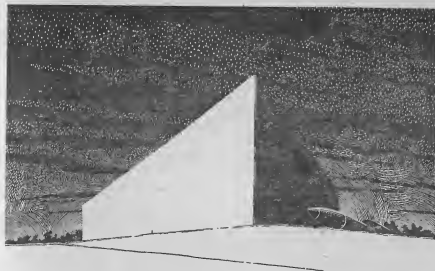
A scout ship hung against one side of the massive interstellar cruiser, connected through interlocking ports. The little ship was loaded, ready to leave. Its passenger entered the port. He was a small man, with a certain birdlike arrogance—cocky, but without offense, more like a boy, with a boy's assurance. But there was something old about him, too. As if he knew too many questions that could not have an answer. Under his arm he carried a book that, even to judge only by its weight, could only be called a "treatise." His finger marked his place in it.

The pilot of the ship was squeezed

in a chair before the controls. When his passenger had entered, he had swung around. A growing amazement slowly spread over his face. "Who—or what—are you? I've seen many a queer bird since I joined the Weapons Search Commission. But never the likes of you." The words should have been insulting, but they did not seem so. The pilot was one of those hulking brutes who are so good-naturedly tactless as to make offense ridiculous.

The passengers paused on top of a box. "I am Ter Ahnkhart." His voice was stuffy. "I am one of the principal authorities on Socio-Logic. And who—or what—are you?"

The pilot chuckled. "Oh, don't get me wrong. My name's Meik Lanfrot. Your pilot." He heaved



himself out of his chair. Standing, he reached almost to the overhead. A giant of a man, but built in powerful proportion. He held out a hand to the other. "You just don't look the kind for expeditioning around—the pioneer type, you know. And what's a Socio-whichum, anyway?"

Ter blinked. "Socio-Logic is the mathematics of the integration of peoples into social systems. The symbolic logic of social stability and capability." After a moment's hesitation he took the offered hand.

"Oh," Meik answered. He blinked again. "That's nice, if you say so. What you going to do down there?" He waved vaguely toward the star that showed bright through a port. "I mean, from what I hear, they seem to be doing all right by themselves."

Ter stretched himself up. He looked vaguely around, as if searching for a blackboard. "The objective of The Weapons Search Commission," he announced, "is to try to find, among the thousands of worlds that formed the First Galactic Civilization, some weapon that will save us from the Slugs. They, the Slugs, came in from the edge of the galaxy about two hundred years ago. Since then, they have taken over a third of the Federation. It is absolutely imperative that we find some effective weapon against them. It is our hope to find one among these forgotten residues of the First Civilization."

"Such a weapon apparently exists down there," He indicated the star. "The primary expedition did not think so at first. The one inhabitable

planet, Torlinda, is mostly wild. A city—the City—is the only relic of its civilization. This city was built, apparently, about twenty-five hundred years or more ago. It was built, it seems, because they had somehow got what is called a 'degenerate manifold' going—an atomic fire that after about fifty years of burning, was going to make their planet uninhabitable. Their technology, to judge from the City, was at the seventh level. Fairly primitive. Enough advanced to start the manifold, but not to stop it. Their only choice was to let it burn until it got too large to sustain itself, putting itself out. But that was going to be too late. Man would have been killed off by the spreading radioactivity long before. So they built the City. A self-contained machine to keep a few hundred thousand of them alive until the world was safe."

Meik tried to interrupt, but failed. The mathematician continued without noticing. "The primary expedition did not think it a fertile ground for the weapon we seek. Its apparent technology, as I said, was only seventh level. Ours is twelfth. And with the utter stagnation that has occurred with the inhabitants how could they have developed a weapon that would be better than those we have? Hence, after the most cursory examination, they decided to leave. But then the trouble came. For they were unable to move their cruiser. The Prime Generator appeared to be working. The matter that is its fuel disappeared. But no

energy was being delivered to the Drive. Somehow, in some way, something was tapping that energy off. The expedition did not know how this was being done, and they could not even detect whatever field it was that was doing it.

"So, somewhere there, there is a weapon. The Slugs use the same subtemporal Drive as we. If we could paralyze their ships, drawing the energy from their own generators—" His voice trailed off.

Meik sighed. "All this I know. I work for the Commission, too. And I've heard about the cruiser being stranded down there. After all, that's why we're using this ion-jet buggy. These things mostly are only used near labs, and whatnot, where the fields of the Drive might mess things up. But I still want to know what you're going to do down there."

"Oh, part of the problem is certainly Socio-Logic," the little man answered. "The City appears to be a machine—a seventh level machine. Yet the weapon is above our technology. Presumably at least thirteenth. How does a machine improve its own science? Yes, I feel it is important to understand the City. Until we do, I do not think we shall get the weapon."

"And you're going to figure out the City?" The big fellow looked amused.

"I intend to." The mathematician spoke with confidence.

"Oh." Meik looked even more

amused. "This I got to see."

Ter looked at the pilot a moment, his head cocked on one side. "You appear to be doubtful."

"Well, just a touch, perhaps." Meik grinned. "Seems like a pretty big mouthful. And you only got one mouth even if it is big."

Ter sputtered. "What do you mean?"

"Nothing. Nothing at all." He was still grinning. "What's the book, not to change the subject, or anything?" He waved at the tome Ter still clutched.

The mathematician blinked. He seemed to ponder whether or not to let the subject be changed. Then, suddenly, he blushed. "This? Oh . . . ah . . . it's just something I brought along for the trip."

Meik cocked his head to read the title. "'A General Survey of Cerebral Micro-Neurology.' Huh?" His mouth fell open.

"The nerve patterns of the brain," Ter explained, rather bashfully.

"Oh." The pilot still looked confused. "But what has that got to do with this Socio-something-or-other you work at?"

"Nothing," Ter admitted. "At least not much. Although there are some strange points of similarity. But a friend of mine wrote this. Anyway, it's interesting."

"Well, it's your business, I guess, how do you amuse yourself. And I guess if you're going to solve all their problems down there, we'd better get going. Strap yourself

down. And put the book on the floor. A guy like you is liable to get crushed by a book like that."

Ter sat in the passenger seat with offended stiffness. The pilot turned to the control board and began to do those things that had to be done to take the little ship to the enigmatic world of Torlinda.

They landed on a grassy plain outside the City: It stretched for about a quarter of a mile uniformly circling the City as far as they could see. Beyond lay a jungle that looked wild. A glowing ring of mesotronic force defined the edge.

The city that rose before them looked like a huge cube of metal. The wall rose sheer—a blank, impervious looking face—a shell hiding within it the hopes of the ancient Builders. Only a single small opening was apparent.

Alongside lay the huge ship that had brought the initial expedition. It lay quiet, without sign of life. No light or sound came from it. The two who had just landed knew that it was, in fact, nearly dead. The mighty primary generator that could draw the energy from enough matter to power a small star—enough to hurl the ship out of normal space and time—was useless. The generator would appear to work, they knew. The matter that was its fuel would disappear, burned in its fires of warped space-time. But the energy that should have been delivered to the drive, just vanished. Somehow it disappeared into a field whose very ex-

istence the expedition's experts could not find. The ship was useless—but its very usefulness proved that somewhere on this world existed a weapon—the weapon that humanity so desperately needed to keep the Slugs from pushing them out of space.

The two men walked over the grassy plain towards the entrance. The mathematician danced ahead like a cocky sparrow. The pilot lumbered in the rear.

When they came close, they paused. An inscription was embossed over the square door.

"Stranger, witness and behold," Meik murmured as he read. "Before you lies the City of the Phoenix. Study it as you will, but walk softly. For it is written that this city shall carry the last hope of us who have destroyed our race. It is the shell to carry the spark that is all that remains of Man."

"Walk softly, stranger, lest you break the dream. Let the cycle run its course, that the phoenix may arise from his ashes. And if it be that in your memories, you ever think on this, then pity what we leave. For now the phoenix sleeps. But when it wakes in all its newborn innocence, then shall its task begin. Then shall its trial start. And we, who built the City, shudder before the prospect."

"Walk softly, stranger, and depart in peace."

Meik scratched his head. He stared around him. He turned to

Ter, who was busy copying the inscription in a notebook. "Say," he finally asked, "what's this here phoenix?"

"Eh?" Ter looked up. "The phoenix is a mythological bird." He spoke with an air of abstraction. "It dates, I believe, from prehistoric times. It achieved immortality by periodically destroying itself—with fire, I believe. And then regenerating itself from the ashes. A very ancient myth."

"Oh," Meik shrugged. "Then, I guess it makes sense."

"No," the mathematician answered abstractedly. "It doesn't make sense."

"Huh?" The pilot stared at him a moment. "The Builders got this what-d'yuh call it . . . something manifold? . . . started. It was burning the planet up. So they build the City to keep some people alive, anyway. So there is some people around when things get a little less hot. So humanity can get reborn. It figures. See?"

Ter turned and looked up at the big fellow with a condescending air. "As far as that goes, of course. But I ask you to note that it says the City holds 'all that remains of Man.' To put the matter simply, we are men, aren't we? And we are not in the City." He was thoughtful a moment. "Of course, they might have forgotten the First Civilization that fathered the original colony on this planet. It could happen. When the breakup of that civilization came, nearly everybody lost much of their

technologies, of course. A world like this could have lost so much technology they went clear back to barbarism, holding the memory of the earlier period only as mythology. So perhaps you are right. Maybe that part is not so confusing at that." He nodded thoughtfully to himself.

"Sure." The pilot looked self-satisfied. "That's no doubt exactly what happened."

"It's what *may* have happened." Ter's voice was sharp. "But that still leaves another question. Because it says quite distinctly that the City is only temporary. 'When it wakes—' Then *shall* its trial start.' So the City was to survive only as long as it was needed. Which should have been less than a thousand years. The degenerate manifold would burn for about fifty years. The radioactivity would saturate this world for another few hundred. A thousand years would have been amply safe. Twenty-five hundred is ridiculous."

Meik scratched his head. "Maybe they didn't know."

"Hardly likely, in view of their technological level." The little man's voice was sharp. "And furthermore, even if they didn't, they could have easily rigged a way of testing the atmosphere. No, I consider it extremely significant that the City has so far outlived its usefulness. Extremely so."

"Significant of what?" the pilot asked.

Ter turned and looked at him.

The mathematician frowned. His lips contracted to a line. "Have you nothing better to do than to follow me around, pestering me with these idiotic questions?"

"Nope," Meik grinned.

"In that case, will you please find something to do." It was a command, not a question.

"Nope." The pilot's voice was pleasant but firm. "I still want to see you figuring out the City, like you said."

"I insist." Ter's voice was rising in pitch. "If you do not, I am sorry, but I shall have to report you to the authorities."

"Oh, that," Meik chuckled. "As a matter of fact, they told me to stick with you—partly like a bodyguard, and partly just like a guard to keep you out of the expedition's hair."

"What?" the little man almost shrieked. "To keep me out of their hair?"

"Yeah," the pilot shrugged. "They seemed to think you might get in the way." He grinned. "It seems like they got more faith in the expedition than in you." There was nothing malicious, however, in his tone. Just amusement.

Ter sputtered. He fumed. He turned abruptly and strode violently through the door into the City. Obviously he was mad. Too mad even to wonder further at the affect of the Builder's error in thinking that all humanity was on Terlinda. Too mad to wonder why the City still functioned, long after it was no longer needed. That Meik,

the blundering idiot, insisted in following along was enough in itself. That the powers on high in the Commission thought it necessary to send the pilot along to keep him—the outstanding authority in Socio-Logic—from interfering with the expedition—!

Meik followed at a discreet distance, still grinning.

The corridor they entered was a short one. It ended in a large hall. The place seemed deserted, until a voice behind them spoke. "What do you know—new faces, or something?"

Turning, they saw that a panel of some kind of plastic had been set on boxes near the wall, forming a kind of desk. On top, the most conspicuous object was a pair of long and neatly crossed legs. Behind, a surprisingly pert face was well set off in a glow of bright red hair.

Ter gulped. His eyes bulged. His mouth worked but no sounds came out. The owner of the legs watched him a while, then turned to Meik. "Should I maybe call the doc, do you think?"

"Dunno," Meik answered with a grin. "Maybe. Being as how he's an upstanding expert or something, maybe he's never seen the such as you. Leastwise not from this angle. It could be it's sent him out for the count."

She laughed. Putting her feet down, she sat up. "Well, in that case— Who are you, by the way? Just to make conversation while he

fights his way back in. To break the ice, I'm Tricky Mordanne. Secretary and whatnot to the primary expedition."

Meik introduced himself and the mathematician, and explained what they were.

"Glad to meet you," Tricky said. "Are you just here for a visit, or have you a purpose in mind? Because I don't recommend this place as a pleasure resort. Much too unhealthy."

Ter cleared his throat. He blushed. He stammered a bit but finally managed to speak. "I am here to study the City. I believe I can contribute materially to the objective of locating the weapon that appears to be here."

The girl looked at him interestedly. "That's nice, though at the moment it escapes me how a Socio-Logician can help. However, we'll let that pass. And if by any chance, you do get some ideas that pay off, I for one, won't care if you're a professional bird-watcher. For by the triple scepter of Besida, we need ideas. So set you down and have a drink."

"Drink?" Ter looked surprised. He also seemed stunned at her flow of words.

"Drink," she nodded, pulling a bottle from under the so-called desk. "Praise the manifold lords of destiny for alcohol. It's all that holds us together, here. That and the green fields and waving grass outside."

"Oh," the little man said.

"Though I must say I don't see why it is so bad, here. It looks like a rather mechanical heaven, in fact." He stared around at the graceful curves and abstract design that covered the walls, illuminated by glowing pastel colors that softly modulated into one another. He listened to the undertone of gentle music and smelled the subtle aroma that lightened the air. "It is beautiful. A dream city. The City of the Gods."

"Yes, and practical, too." The girl's voice rasped. "Everything supplied—food, drink, light, heat. Beautiful clothes in all the latest shades." She pointed at a group of the City's inhabitants who had entered at one end of the hall. The group was drifting gently across the corner toward a doorway. They were dressed in flowing robes that billowed about them like delicately tinted clouds. Beautiful, they were. But even from the distance there was about them an air of sexless apathy, of dreamy unawareness that made some corner of the mind revolt in instinctive fear. "And if, by chance, yonder lotus-eaters should in their innocence, drift off a balcony, the City will even piece their bones together." Her lip curled.

"Really?" Ter leaned forward, eyes wide. "A mechanical doctor?"

"Yes," she nodded. "Even to the point of removing appendices, and things like that. But don't be too surprised. Though I admit we were startled, too, at first. We studied it. But now our technicians say there's nothing incompatible about the

City's technology and its robot doctors. We could build mechanical sawbones, too. And they would be a lot better than those they have here. But why should we? Who would use them?"

"I see," the mathematician nodded. "Yes, we would have no use for a mechanical surgeon. A robot can not know as much as its maker. A loss in information necessarily occurs between the designer and the device. Anyway, I don't think I would like to have my appendix removed by a gadget."

Tricky laughed, but she took a long drink. "The less I have to do with any of the City's gadgets, the better I'll like it."

"Why?" Ter peered around him. "I would not use the medical gadgets, but I would not say the rest of it was so bad."

"You're wrong." The girl bit the words out, a sudden rasp in her voice. "It is bad. You are new. It has not yet had time to get to you. But listen. Listen very close, underneath the music. Listen with your body, not your ears. Do you hear a sort of something? Way down deep? Too low to be sound, too high to be vibration? Pulsing. Rising, falling. Modulated in time with the heart. Do you get it?"

The two men both cocked their heads. Ter nodded after a moment. "What is it? Machinery?"

"No," she said. "It seems to be deliberate. Rankor, our psychologist, thinks it is one of the things

that keep the inhabitants asleep on their feet. That and the lights."

"The lights?"

"All different colors, you see," she pointed out. "Though soft colors. Pretty, isn't it? But if you watch them, you'll see the colors change. The general level changes, too. Slowly, with a rhythm that drives you bats. You get so you stagger around. The walls seem to blur out. You forget where you are, or even who you are."

"I don't see how it can be that bad," Ter objected.

Tricky shrugged. "You will. Or you're a better man than the rest of us. We all go screaming for the outside every so often. A couple of the chaps have had to be led out. Passed clean out. Started drifting around like these automatons that live here. So watch your step while you're here." She took a deep drink.

"I am a mathematician," Ter drew himself up. "I have been trained to make my mind do what I want it to. I cannot think I will have any trouble."

Tricky put her chin in her hands. She looked at the mathematician with a half mad, half pitying expression—as if he were a boy determined to do something she knew he would later regret. "I suppose it's your mind," she finally told him. "But if, when the City breaks you, you feel any inclination at all to come running to me for help—Oh, bah. Go out and get yourself burned. I'll bandage you up, I sup-

pose. I'm a sucker sometimes."

"Burned?" Ter asked.

"Yeah," she told him. Her mouth twisted. "Your mind, though. Not your body. So far, anyway, the City hasn't physically attacked anybody. Just tried to drive them bats. And done too good a job, too."

"How?" His voice was clipped—professional.

She shrugged. "Sundry odd cute little tricks."

"Miss Mordanne, I am asking for information. I would appreciate an answer." He bit the words.

She sat up. Her eyes snapped. "If it's information, you want, you can get it yourself. There's a door over there."

She pointed along the wall. "Just walk right in and make yourself to home. It's a bedroom the inhabitants aren't using right now. Just stay there a few minutes. You'll get all the information you want."

Ter stared at her. His face grew red. "Very well," he snapped out. He spun on his heel and started to march to the door.

"Wait," she called when he was halfway there. "In my book you're an idiot. Knowing nothing of what's what here, you still go merrily bargaining in. You're arrogant, cocksure, and a blasted nuisance. But, for the sake of my own conscience, take these with you." She reached under her improvised desk and brought out a couple of gadgets.

"What are those?" Ter did not move, and his voice held an icy aloofness.



"A cutting torch and a flashlight."

Ter made no move to return for them. He and the girl just stared at each other. It was Meik who broke the deadlock by taking the gadgets and walking to the door. Ter turned his back to the girl and walked into the room. Meik followed close behind.

"Close the door," Ter ordered. The pilot obeyed.

"Look, boss," the big chap said, "you hadn't ought to talk to a pretty thing like her that way. Leastwise not one with hair as red as hers."

"It is, isn't it?" The little man's eyes had suddenly become soft. Dreamy. But suddenly his lips tightened. "But neither should she talk to me that way. Words. Millions of

them. And none of them say anything. I ask her a question and she tells me three other things. And none of them matter a damn."

Meik chuckled. "You ever seen a dame that ain't that way? Matter of fact, that's the best way to have them. Means they got things on their minds they don't want to say. Cover them up with words. And maybe one of those things is you. A good sign." He nodded to himself.

"You think so?" Ter asked. "I guess I don't know much about women. I have always been too busy." He was thoughtful a moment, his eyes regretful. "And then, of course I should have made allowances. The subsonic rhythm and modulated light seem to have got on her nerves. I suppose they do be-

come annoying after a while."

"Yeah," the pilot agreed. "She seems to be awful touchy about them." He looked around the room. "This is a nice little hole, isn't it? Just like a prison." The simile was apt. The room was barely big enough for the two of them to stand alongside the double bunks on the long wall. On the opposite wall were two narrow drawers. Otherwise the room was bare.

"It is a little grim, isn't it," the mathematician answered. "I can see where a person could easily develop a fine case of claustrophobia. But it doesn't seem likely that that was what the girl meant, do you think?"

Meik had no chance to answer. As he opened his mouth, the lights went out. A second or so later they flashed back on. But instead of the softly glowing pastel shades, they returned in painful whiteness. And then they turned to a yellow green that turned the stomach. It pulsed, bright, and out, brighter, brighter, out, and bright again. A pattern—but a pattern that could not quite be found.

"Hey boss," Meik's yell echoed in the room. "The door's locked."

"Really?" The mathematician sounded bored. He did not turn to look. If he had, the motion would have been wasted. At that moment, the light went out. This time it stayed out.

In a moment, Meik asked "Light, boss?" His voice held an uncertain note—a quaver that he was obviously trying to control.

"No thank you." Ter sounded quite at ease. Perhaps he said more. Meik had no chance to hear. If he did, it was lost in a sudden blur of sound. It rose, the screaming rasp of shattered gears, the shrieking agony of twisted metal. It drowned all thought, as it rose to a crescendo. Then, as suddenly as it had started, it stopped.

The silence held a moment. Then, as if so very far away, they could hear the sounds of laughter. Laughter that was not funny—that made the lips twist. The laughter of hell.

Suddenly a human voice screamed in horrible expression of the final agony. Over it rose the laughter, a man's voice once again. Hideous, insane laughter, that swelled against the screaming voice in gloating sadism.

Slowly, gently, with insidious subtlety, there came the unmistakable odor of burned flesh. Like waves, it came, timed with the awful laughter, beating against the consciousness, driving the mind to final revolt. Madness.

As the sound had come, and the smell, so did it leave. It stopped, as if the needle had been lifted. Suddenly. Completely. Only the rhythm of the City was left. It was loud, and faster than it had been—like a clock that goes too fast. Hurrying, marking the passage of time.

Ter spoke. "Light, please." His voice showed nothing.

Meik threw the switch. Ter blinked against it. But otherwise, his face showed nothing. It was im-

passive, calm. Meik, apparently, was not so calm. The beam from the light in his hand trembled and wavered.

"I wish to leave, now," Ter announced. "Are you able to handle the torch?"

Meik tried, but he could not do it. His hands would not stay still. So it was Ter who burned the door open. When it was done, he strode out, not hurrying at all beyond his usual pace.

Tricky was waiting for them. She held another cutting torch. Apparently she had been trying to decide whether or not to cut her way in. She stared at Ter in obvious surprise. "Didn't anything happen?" But then she looked at Meik.

Ter smiled. The smile was rather cold and bleak. "I should judge we got a fairly complete treatment for the time we were there."

"By the looks of Meik," she answered, "I wouldn't doubt it." Her eyes were narrowed as they studied the mathematician. "My lad," she asked, "have I perchance misjudged you?"

He looked at her. His face got red. His hand went through his hair. He shifted on his feet. He looked like a boy receiving unexpected praise.

Tricky's mouth crinkled. "You know, I thought you were a foolish little boy. You talked so big, not knowing at all what you were getting into. I expected to see Meik dragging you out by your feet. I

had visions of myself holding your hand and trying to comfort you." Her eyes studied him. "You couldn't use just a little bit of comfort, maybe?" Her voice was soft and coaxing. She walked up to him, a hidden smile on her face.

With a hurried motion clearly of retreat, he scuttled around her and perched himself on her desk.

Tricky tried to look disappointed. But her lips twitched. She winked at Meik who had recovered enough to grin in answer. Ter looked acutely uncomfortable. With an obvious effort to get the conversation out of what he clearly thought were dangerous channels, he said: "This thing is most interesting. And you say this always happens?" He briefly described what had happened.

"That's what happens," she told him. A shudder went over her. "Every time one of us gets any place where the local boys and girls won't stumble in. Always the same, as far as we can tell. The sickening lights. The wrenching gears. The screams and the burning flesh. The hideous laughter. Always the same." She shuddered again.

Ter nodded. "Interesting. Rather lacking in imagination, it seems. You would expect it to vary its routine a bit, wouldn't you?"

"It's a good routine," the girl answered. "Too good." Her lips twitched.

"But not good enough," he insisted. "Presumably its purpose is to drive us out. And it hasn't done

that. I should think it would keep experimenting around a bit. Try to find a more successful routine. Wouldn't you, if you were it?"

Tricky only shrugged. Clearly she had no desire to think about it longer. Rigid the pattern might be, the only thing that interested her was keeping herself out of its way. Ter did not press the matter. He just looked thoughtful.

Tricky looked up as clipped footsteps sounded down the hall. "Ah," she said, "behold. Our beloved leader comes." Her voice curled. "Lar Kandrasen. Prototype of a hero! Paragon of action. Also, I might add, a man of considerable influence."

The approaching man, Lar, was large and leonine—a handsome man, who probably knew it. He smiled at Tricky as he came up. It was a distinctly arrogant smile. A self-assured one. Perhaps possessive. But Tricky gave no sign of noticing. The smiles he returned was purely professional. Blandly she introduced the mathematician and his bodyguard. She mentioned Ter's specialty.

"Socio-Logician!" The leader's face flushed. "What by all the heathen imps is a socio-logician doing here?"

Ter's eyes narrowed. "You don't think I can be of use?" His voice was quiet, but he was watching the other intently.

Lar's lips curled. "Sure you can be of use. Never meant you

couldn't. I need somebody just like you—to hold my tools for me." He roared with laughter.

"I obtained the consent of the Commission," Ter pointed out.

"Them." Lar was contemptuous. "How many of them have ever left atmosphere? What do they know of anything? They'd fill all the ships up with veterinarians if they had them." He spat on the floor. "The ships I need to bring equipment in."

"I see no point in that attitude." Ter's voice was still mild. "I used only one little scout ship, and you've got lots of equipment on the cruiser, haven't you?"

"Not the kind you need to take a City apart with." Lar's voice was bitter.

"Take the City apart?" Ter seemed surprised.

"Yes, I intend to take it apart. Panel by panel. Beam by beam." He sounded sadistic. Gloating. "I need equipment for that. Big stuff—with plenty of weight and push. The cruiser hasn't got that kind, nor the men to run it. And even your 'little scout ship' could be useful to me in bringing it or the men in. It would be a lot more useful to me by doing what it could for that plan than by giving socio-logicians a pleasant junket." He sneered.

"But why take the City apart?" the mathematician persisted.

"Why?" Lar appeared confused for a moment. "Why? Well, I'll tell you." His voice became sarcastic. "Somewhere in this City there's the weapon we need." His sarcasm was

heavy. "And it's our job to find it. It's hidden somewhere. So we'll just take the City apart until we find it. Is that clear now?"

Ter rocked back on his heels like a sparrow defying a bear. "It's not only clear. It's asinine." His voice was cold.

Lar stared at him, color rising to his face.

"It's not only asinine," Ter went on, "but it is just about as asinine as you could get." His voice was beating a heavy rhythm. "If I really set my mind to it, I could hardly think of a better way to insure failure. His lips were thin.

Lar stared at the mathematician, his face white. "How long have you been on Torlinda?" he asked, his voice low and intense.

"An hour or so," Ter admitted. "But it's long enough—"

"And have you ever in your life been with a Commission expedition before?" The leader's voice was rising.

"No, but—"

"Then will you kindly let me do my business my way?" Lar's voice reached a roar. "And in the future, if you want my advice, stay out of my sight. Get off Torlinda. Let me forget you exist. I'm busy. I've got a big job here. And no sniveling little would-be genius is going to tell me how to run it. Try it just once more and I'll break your jawbone." He knocked Ter aside and stamped out of the hall.

Ter stared after the big man. His lips were tight. He gave a rueful chuckle. "I guess my psychology wasn't exactly right, was it?" He looked at Tricky.

"No-o-o," she pursed up her lips. "I wouldn't say so. Unless you were being subtle about something."

"Subtle?" He looked puzzled.

"Well," she explained, "it depends on what you were trying to do. Were you actually trying to stop him from razing the City?"

"Of course." He still appeared puzzled.

"In that case then," she smiled, "your psychology—and I quote—was just about as asinine as it could get. In the first place, Lar is the top man here. And it's not generally good practice to use such language to a top man. At least not unless he is a very, very big man. And Lar, in spite of his physical size, is very very small. So, I fear that all you have accomplished is to make very sure that Lar will never, under any circumstances, ever listen to you.

"In the second place, you were also playing the fool to talk to him that way because it is dangerous. He's a dangerous guy. Not only because he's top man here, but also because he's got influence. Potent influence. He's the nephew of the head of the Commission. You are liable to wake up some morning to find yourself out in the bitter cold."

Ter seemed to be abashed. "Oh," he said. "But still and all, what could I say? What can you say to anyone so imbecilic as to want to

take the City apart?"

"You keep harping on that." The girl frowned. "Maybe I'm an imbecile, too. But what's so bad about that? We need that weapon. We need it awfully bad. And how can we get it except by looking for it?"

"I don't know," the little mathematician admitted. "But I know you won't get it by looking for it. Not if 'looking for it' means taking the City apart."

"Why not?"

"Because the City's neurotic."

"Neurotic?" Her mouth fell open. "How can a City be neurotic? The people in it, yes. But a City like this, one that's really a computing machine?"

"There's nothing to stop a calculating machine from being neurotic," he told her. "You call a person neurotic when some of his basic drives conflict. You can equally well call a computing machine neurotic if you give it, as basic premises for its calculations, statements that conflict."

"What kind of conflict is there here?" she asked. "Except between the City and us?"

"That, as a matter of fact," Ter said, "is probably one of the things producing the present symptoms of neurosis. Not the conflict itself, but the situation."

"You may be clear to you," Trickey grumbled, "but you've got me nicely tied up."

"Well," he answered, "consider what the basic orders to the City probably are. One of them probably

is not to harm the people in the City but to protect and guard them. After all, that's the original purpose. But the inscription over the main entrance says quite clearly that all the humans left in space are in the City. So probably the Builders in laying down the basic rules for the City as a calculating machine, neglected completely to distinguish between people that were of the City, and those who were merely in it. Like us. Now we are humans. And we are in the City. So the City must not harm us. It says so, right there in the City's circuits.

"On the other hand, if we start taking the City apart, that's going to be bad for all the people who live here. And it has to protect and guard them. It says that, too, right there in the circuits. The situation is one of basic conflict. I call it neurotic."

Trickey nodded thoughtfully. "I suppose you're right." She frowned. "But what's that got to do with being so rough on Lar?"

"The City's got a weapon that beats anything we have." His voice was painfully patient. "And if you make the conflict severe enough for the City, something's got to break. If it does, we're apt to find that weapon—exploding in our faces."

The girl blinked. She thought a few moments. Hesitantly, she nodded. "It might be dangerous, at that."

"It is dangerous. It might be deadly," Ter corrected her.

"Yeah," she accepted. "But we

still have to get the weapon some way. The Federation needs it too badly."

"True," he admitted, "but you won't get it Lar's way. It's like trying to get a bomb away from an insane man by threatening him with whips. It's a fool way to go about it." His face was grim.

Trickey nodded. Her eyes were thoughtful. She looked about her, clearly realizing for the first time the potentials of the place she was in. She also looked at Ter with wondering eyes as she realized that he had presented a wholly new viewpoint to her—the viewpoint of the City as a functioning entity, and not merely as the area containing the desired weapon. The thought dawned on her that she, and the expedition, had perhaps lived too long, too close to the search for the weapon. They had perhaps lost some of the flexibility of thought their purpose needed.

And she looked at Ter wondering, too, what manner of man he was. Wondering if he was more than a clown. She was prepared to revise her first opinion.

"O.K.," she finally agreed, "I'll concede the point. The City's neurotic, and Lar is apt to set off an explosion. So, we had better move fast."

"We?"

"We." She nodded emphatically. "You interest me. I like the fireworks you seem to stir up."

Ter stared at her. "Why won't

people leave me alone," he sputtered. "Here I'm only trying to help. So I have to fight my way through the front office to get here. And then they tell this . . . this baboon to follow me around." He waved at Meik. "Now you decide you'll join the procession. Has it occurred to you that perhaps I don't want you along?" He was practically jumping.

"Oh, it's occurred to me," she answered. "But I shall ignore the remote possibility." Her voice was cool. "Unless, of course," she added, thoughtfully, "you are planning to research some of the young female inhabitants?" She managed to look shocked for a moment.

He turned crimson. "I am not that kind of a man," he sputtered. "I have no interest in forcing my attentions on anyone."

"No force required," she answered blandly. "Give any of the local inhabitants an order, and it's obeyed without even the thought of a question."

"Nevertheless, I assure you that such action is very far from my intention." His dignity was rampant.

"Well, then," she asked, "what action do you plan? If I'm going to be along, I think I ought to know."

"I have no plans that include you," he snapped.

She smiled innocently. "Possibly. Possibly. But I doubt it. I am a woman of determination. Or, at least, a woman. Have you noticed?" She made a quick twirl.

He glowered at her. Then, ap-

parently giving it up as futile, he turned and strode down the hall. Trickey tiptoed at a run behind him. And Meik, with a chuckle on his face, brought up the rear.

They went down the hall and out the end. They continued down a corridor that bore an air of some importance. At various points, smaller corridors joined it. From these, as they progressed, a cloud of waxen-featured humans drifted. These, the inhabitants of the City, were the dreamers. They seemed to float, impelled by some stay wind. Their faces all looked the same. Not because of any uniformity of feature, but in their vacuity. Young

and old. Men and women. Idlers, listening with unknowing absorption to the hypnotic beat that made them drift together.

By the time the corridor came to a second large hall, it was packed. At first, the little mathematician had darted around each group of dreamers. Behind, Meik had lumbered with a certain skill, knocking down only a few. Trickey had trotted in his wake. But near the end, the mass of sleepers had become too great. When Ter could no longer dodge around, he slowed to the pace of the drifters. He made no effort to push through.

The hall that they eventually came to was as large or larger than

the first one, but this one was crowded with benches. Row on row, filling all available space. Quietly, Ter led the way to seats in a corner, and sat down. The other two sat beside him. No one said a word as they watched the inhabitants slowly fill the hall.

When the hall was full a dead silence fell. With the thousands of people that were present, such a silence was uncanny. It seemed as if they had all turned to wax, without motion, without life.

Faintly, a sound arose—a tone of moderately high pitch. Its volume gradually increased, and, as it did, a modulation on it developed—A slow and ponderous pulsing. The average level rose until it almost became a pain. And then, it stopped. Stopped as if it never had been. Only the silence remained.

A voice was heard. Low, and barely audible, at first, it gathered strength. "Now listen to me you who are my brothers. Listen and believe. As you have faith in me, so will I have faith in you. Listen, you, the blood of my veins, the force of my life. Listen, and know that what I say can only be the truth."

Like a wind pounding on a cave, the multitude answered. "We listen. We hear and know that all things are even as you say they are."

And the voice answered. "I am the shell of the Phoenix. You are the Phoenix. In you lies the Purpose of the Builders. In me lies the Way to that Purpose."

"We hear and we believe." The

crowd chanted its response.

"You are all that remains of mankind. In you lies the destiny of mankind. When the time is right, you will leave this shell and re-establish over Torlinda the empire of man."

"It shall be so." The voices roared in answer.

"But the time is not yet right. The evil forces set free by the blunders of the Fools who defied the wisdom of the Builders has not yet lost its force. The time is not yet right for the Phoenix to break its shell."

"Not yet," the echo of the multitude sighed in answer.

"Wait, then in peace and with patience. Wait, and dream of the day when the Purpose will be fulfilled. Wait, and think not of that which might have been, or worry lest that which is, be not that which must be. Wait, for even as corruption can destroy the phoenix, so could the inheritance of the Fools destroy the dream."

"We shall wait." The voices dropped like a hymn to despair.

"Wait, and in the waiting, dream. And while you dream, I shall be watching. To my eyes, come all things that are true. In my brain, I know only the Purpose. I shall compute the Way. I shall find the road to survival. And when the road is open, then my hands shall set you on it. Dream, then, while I compute survival. Dream, and wait in peace."

"As you have said, so shall it be." The voices of the crowd faded off



into silence. The quiet filled the hall. And then, the modulated tone that had begun the ceremony picked up where it had suddenly stopped. Slowly it died down, until, as a whisper, it faded out as it had started. When it was gone, the only sound was a faint rustle as the thousands rose, and slowly drifted out as they had come.

The three outsiders sat until the hall was empty. Then Ter turned to the girl. "Does this happen often?" he asked.

"Every day," Trickey answered. Her voice quavered a little. "These halls are scattered all through the City. And every day at this time, they all crowd in. Always exactly the same. The same voice, the same words, the same response."

"You sound upset." Ter cocked his head.

"I am," she admitted. "Their hypnotic techniques are good. We spend most of our efforts fighting it. How come it doesn't bother you?"

Ter shrugged his shoulders. "Possibly because I am interested in the City—not just in the weapon. I keep studying, and asking why X does this. What is it X is trying to do when it does this or something else. I am not trying to ignore X, in other words. It is one thing to hypnotize a subject who is trying to do something else. It is another when the subject is trying to analyze why you are trying to hypnotize him, and how. And, it is my impression that the latter presents a

much more difficult case."

Tricky looked at him. Her eyebrows went up. "You could be right at that, you know. It is just barely possible." She smiled a little ruefully, "And having then thoroughly analyzed what the City is doing, and how, what is your conclusion?" Her voice became a little mocking.

"I don't know," he groaned, dropping his head on his hands. "I don't know. It just doesn't make sense at all."

"Why Ter," the girl looked pleased, "I thought you knew all the answers."

"I don't know any of them," he muttered. "Maybe I should have stayed where I belonged. I seem to have only messed things up and mixed myself all up ever since I got here."

Tricky looked at him with eyes that were half amused—and half something else. "You have certainly stirred things up," she admitted. "But, as I diagnose your present melancholic condition, I suspect you are simply hungry."

"Hungry?" He seemed startled.

"Hungry," she nodded.

He meditated a moment. "Perhaps you're right."

"I feel sure of it. Because I'm hungry, too." She looked at him expectantly. He just looked blank. "Of course," she went on when it became clear he was not going to rise to the bait, "I don't know what I ought to do. After all, a girl must be careful. But still, I guess with Meik along, it will be all right." Ter

still just looked confused. He looked at Meik.

"Boss," the latter explained, "we got us company for supper." Ter looked startled. His eyes lit up. Then, with an effort, he frowned. His mouth opened, but he said nothing. Finally, he simply got up and walked out. The others, as seemed to have become the custom, trailed.

Supper was a quiet affair. After it was over, Meik disappeared into the other compartment of the scout ship to clean up. Tricky sat on the edge of her seat. "I should start screaming," she told him in a calm voice. "Here I am, trapped in your ship. I observe that you are sitting between me and the door. My situation is clearly desperate. However, I always try to be rational. I realize that no one would hear my screams and in all likelihood, such activity on my part would only incense you the further. So, I shall attempt to reason with you."

Ter stared at her. "But I have done nothing," he remonstrated in a startled voice.

"Well, there is that fact," she admitted. "But still and all—Probably you are sitting there coldly planning sundry devious schemes. And, as I mentioned, I am obviously entirely at your mercy. The situation is quite deplorable. My trouble, you see, is that I am so naive. Most girls would have had the sense not to get themselves in my position, but I, of course, never dreamed the hidden

depths within you. I shall simply have to try to make the best of it." She leaned back, her arms behind her head, and smiled a lazy smile at him.

Ter's eyes were wide. He looked confused. He stared around him, clearly looking for escape. His eyes avoided Tricky. "Haven't... haven't you work to do?"

"Work? Oh, yes, work. Hm-m-m. Let me see. Work, now. There must be some I should do." She let her head drop back. "But then there are different kinds of work. Aren't there?" Her voice was soft.

Ter got up, a little pompously. "If you haven't, at least I have." He began busily to open boxes and haul out parts of the portable computer.

Tricky sat up. She looked partly annoyed but mostly amused. This man intrigued her. His reactions were so totally different from those of the average male she had met. She thought of Lar for comparison and grimaced.

When the computing machine was assembled, it filled one corner of the control room. The rest of the floor was soon covered with filing boxes, filled with spools of data. As each box was opened, Ter searched over the list of contents, selecting an occasional roll and feeding it to the calculating machine. Finally, he sat down before it. His fingers began to move over the controls with steady rhythm. He muttered to himself, as the lights flashed and the

dials spun. But he said no word to the other two.

Meik and the redhead settled down in their seats to watch. The minutes stretched on and on. Only Ter's fingers moved, and the lights flashed for nearly three hours. Finally, however, he leaned back, his face showing the weariness of long concentration. He stood up. A look of dull bewilderment passed over his face when he saw the other two. "You still here?"

"Yep," Tricky answered. "Oh," he said. He staggered a bit. "I'm tired. I want to go to bed." His voice was pleading.

"O.K.," Tricky waved. The mathematician blinked, suddenly alert. He wet his lips. He blushed. "What do you mean?"

She laughed. "Nothing. I'll see you in the morning." She left.

The next morning, Tricky arrived for breakfast. "What do you know?" she asked. "You should know something after watching all those lights dance for three solid hours." She indicated the computing machine.

Ter thought a moment. "It was interesting," he admitted. "Even profitable. I computed quite a number of different possibilities. All but one proved to have a very small probability. That one seems reasonable. So, I now have a concrete theory to use."

"Yes?" she invited. The mathematician nodded. "You see there are several peculiar things about the City. For one thing, it has

lasted at least twenty-five hundred years. Its general technology is at the seventh level. Now, no one can build a machine—and the City is a machine—which will repair itself forever. Such a machine would have to include complete plans for itself, including plans of the plans, and so on. But any level above the fifth can approximate infinite life. It can do it by duplication and reduplication together with partial self-repair. The larger the machine the more nearly it can approach the limit of infinity. The rate at which it approaches the limit is determined by the technological level."

"What's this got to do with your theory," the redhead demanded.

"Well," he ignored her, "I asked myself how large a seventh-level machine would have to be to function for twenty-five hundred years. There are ways of computing such things by Socio-Logic. I found it would have to cover about twice the area of Torlinda." He paused and looked solemnly at the girl and Meik.

"That's impossible," Tricky objected.

"Precisely." The mathematician looked triumphant. "But the fact of its longevity remains. So, either the general theory of technological levels is wrong, or inapplicable."

"To check on this, I went back and computed how long a seventh-level machine of this size could be expected to run. The answer came out about seventy-five years. Nowhere near long enough for the pur-

pose of the Builders, you see. Torlinda was uninhabitable for about four hundred years after the initial disaster."

"It doesn't make sense," the girl commented.

Ter nodded. "That led me to wonder what was wrong. Could the heart—or brain—be, say, twelfth level and the rest seventh level? But that was unreasonable. If they had twelfth-level science at all, they would have had, or could have developed, the drive. Then they would have migrated instead of incarcerating what was left of their race. So I had to reject that possibility."

"The only remaining possibility is that the machine included a human element. This theory of life expectancy and technological level breaks down completely if a human element is present." After all, one can consider a civilization as a machine with humans as its basic elements. Yet civilizations do not obey this law, as you can easily realize."

"Oh," the girl said. "Well, there are plenty of humans around here."

"Yes," Ter admitted, "but they are not active elements. They do nothing that could contribute to the City's survival. In fact, they simply drain off energy. No, the human factor that seemed to be indicated could not be the inhabitants. There must be—or have been—in the recent past another human factor present. An active one."

"Well, that makes sense, I guess," the girl admitted. "Maybe

they developed the high science indicated by the weapon. If that implies they developed the drive—so maybe they did. And then took off."

"Perhaps," the mathematician conceded. "But I worked from the other angle. I tried to imagine I was one of the Builders. They, the Builders, had a difficult problem. They had to leave an active human factor. But such a group would be extremely dangerous to the Purpose. After all, suppose you lived here, somewhere underneath the City, say. And suppose you were sufficiently alert and intelligent to run the City. In fact, suppose you were so intelligent that you could improve the City. Suppose you had raised your own science from the seventh level—that of the City—to at least the thirteenth. For X, you understand, is beyond us and we are twelfth. Would you stay here, pouring the largest part of your energies into keeping the City going? Dragging this haven of sleep-walkers along as a dead weight on your shoulders? You might for a while, but not for twenty-five hundred years." He paused to let his words sink in.

"Yes, I see what you mean," Tricky nodded. "There must be a human factor. But, being human, it would have ditched the City long ago for its own future."

"Exactly," Ter agreed. "Appreciating this, I began to study the problem that had faced the Builders. They wanted to insulate a section of

humanity for a long time. They did not have the resources—or maybe the time—to build a machine that would actually be capable of doing the job itself. So they had to put in humans to control parts of it and to rebuild those parts whenever they started to wear out. Yet those same humans would be likely to upset the problem. They would be apt to start tampering with aspects they should not touch. They might decide the Builders had been wrong. Or as you suggest—they might wonder why they should slave to keep the City running. So, this human factor the Builders had to introduce would be terrifically dangerous to the central purpose—survival.

"How had the Builders met this problem? How had they introduced a human factor, kept it effective in doing what had to be done, and still kept it from interfering? This was the basic question."

"O.K.," Tricky said, "you've kicked that around long enough. How did they?"

"I do not intend to answer you," Ter replied. "The only solution with any reasonable probability seems too fantastic. If I turn out to be wrong, I would rather nobody knew how wrong I was. But I will suggest that you meditate on the desirable characteristics of the humans that would make up such a factor."

"But you think you know, eh?" she asked.

"I think I know." Ter's voice was flat.

"When will you know if you're right?"

"Soon, I hope," he answered. "The way to test the theory is obvious."

"O.K.," she accepted. "What happens if you prove your theory. How do we get the weapon? That is, after all what we are here for."

"That, too, is obvious," he replied.

Tricky looked at the mathematician with exasperation. He was sitting on a chair with a complacent expression. Suddenly, she jumped up with an annoyed expression. "So, keep your secrets," she told him. "I'm going back to the expedition."

He jumped up, too. "No, look," he cried, "please don't get mad. I don't want to be mysterious. It's just that I'll feel an awful fool if I'm wrong. And I need your help."

She relaxed slightly. "You need my help?"

"Yes, I do." There was something simple in his voice. Something that made the girl sit down with a suddenly cheerful smile. "I'm going to the City," he told her. "Will you come?"

She smiled. "Are you actually asking me along? What's happened? Are my fatal charms finally reaching you?"

He blushed, and shifted on his feet. "I only thought—"

"Oh, don't let me blight this first favorable reaction I've been able to wring out of you. Let's go."

The three of them, Ter, Tricky, and Meik were inside the City when Tricky caught Ter's arm and stopped him. "Hey," she said, "it is all very well to barge in like this, but where are we going?"

Ter turned around. "I do not know." He looked as if about to start off again.

"Don't you think it might be a good idea to decide?" she asked with an innocent look. "Before we get there, I mean."

"How can we do otherwise?" he replied with full seriousness. "I mean your question just does not seem to make sense."

"I know it doesn't," she admitted, "but neither does it seem to make

sense to just go barging off. And are you figuring to explore all the by-ways, looking for whatever you're looking for? If you are, pardon me while I go get some foot salve."

"I suppose you're right," the mathematician admitted. He stood there, poised in thought. Tricky looked at Meik and shrugged. She knew she had failed to trap from the mathematician a hint to their purpose.

"Of course," Ter suddenly cried. "We must have a guide." He looked around. No one was visible. He opened a door. Inside was one of the cells that served as homes for the inhabitants. Two young girls lay in the two beds. Their eyes drifted, without expression, to the open door, and the little mathematician standing there.



"What is your name?" Ter asked the one in the lower bed. She gave no flicker of response.

"You will please tell me what you are called." His voice was even but firm. The girl's eyes clouded over. A trace of puzzlement appeared. Her mouth stirred, and finally she answered: "Trillia."

"Please get up, Trillia." Ter's voice remained impersonal. His face was calm, stripped of all emotion, flat. Not by a flicker did he betray the slightest bit of feeling even when the girl, moving the covers aside, stood up. He simply added: "Please put your clothes on, Trillia." The girl obeyed.

When the girl was dressed, he moved her to the hall outside by a direct order.

"Now, Trillia," he told her, "please lead us to the place where you were born." She jumped. Her head snapped around. A gasping sound escaped from her throat. Her eyes were wide, and a naked fear showed in them.

"Cancel that," Ter ordered, his voice suddenly harsh and quick. Knowing his direct approach had failed, he waited for her to calm down before giving a new order. "Take us to the hall where you assembled."

The girl turned and moved down the corridor. It finally led into the same hall where the three outsiders had sat and listened. The girl stopped at the entrance.

"Please take us to the hall where you first assembled, Trillia." His

voice was low and steady. His eyes were watching the girl intently. She looked around her. She trembled slightly. The mathematician looked relieved when she started walking across the hall. She led them through a maze of corridors, up stairs and down again but drifting with a steady purpose. Finally, she stopped at a hall similar in all respects to the first one, except that it must have been near the center of the city. She stopped and looked around. Her eyes, which, at first, had been half closed, opened wide. The whites showed clear around the pupils, themselves contracted to black dots. She trembled. Clearly some association was badly shaking her.

Ter studied her a moment. "Please, Trillia, show us the room in which you slept when you assembled here." A violent trembling seized her. She did not move. "Do not be afraid," he told her. "When you have showed us there, I will not ask you to go farther." She turned and, with a step that seemed as if weighted with the load of centuries, moved down the passage. She stopped before a door.

"You will wait here, Trillia," Ter told her, "until I tell you otherwise. You will obey no other orders. Do you hear?"

"I... I hear," she answered.

The mathematician turned to Tricky behind him. "She's too near the breaking point," he explained. "I don't dare try to force her fur-

ther. We'll have to change guides."

He put his hand out and opened the door. A shriek rang out. Tricky, looking over the mathematician's shoulder, saw a boy crouched in the exact center of the room. In age, he was perhaps fifteen. But in the abject terror of his eyes, there was no age. When Ter stepped forward, he only huddled down, a whimper trembling on his breath.

"I am your friend," Ter said. "I mean to help you. Tell me please your name." His tone was the same flatness he had used on Trillia.

For a long moment, the boy-only stared at him. Then slowly he straightened. "Bhorka," he finally said.

"I shall help you Bhorka," Ter said. "But first there are many things I must find out. And you must help me to find them out. Only if you do, can I then help you. Will you help me?"

The boy's eyes were wide. His lips trembled. But he answered "Yes."

"I am glad, Bhorka," Ter said gravely. "Because I want to help you. But I can only help you if you will help me. Since you will help me, then I shall be able to help you." There was something hypnotic in the repetition of his phrases. Under them, the boy visibly relaxed. Whether or not he had acquired any confidence in Ter, at least his paralyzing terror had faded.

"Now, Bhorka," Ter went on, "there was a day when first you came to this room. And in the com-

ing, you came along a certain route. If I am to help you, then you must first help me. And the help that I must have is for you, Bhorka, to show me what that route then was. You will lead me back along that route. This you must do for me, so that I may then help you."

In the middle of Ter's words, the boy's mouth had dropped open, horror on his face. When Ter was done, he seemed to shrink down. He trembled violently. "No," he suddenly screamed, "I cannot." Tears streamed down his face.

"You must." Ter's voice was steady, unmoved, unmovable. "This you must do for me that I may then help you. This is the help that I must have."

Sobs racked the body of the boy. But, slowly, as if in mortal pain, he raised himself. The tears still streaming down his face, the sobs still shaking him, he stood up and walked out the door.

Ter's face as he followed showed only pity. That he had triumphed over the boy's unconscious fears did not, apparently, affect him.

Bhorka led them through another maze of corridors, down to a room unlike any they had seen before. It was about half the size of one of the assembly halls. The walls were bare, lighted only with a dull gray light, in striking contrast to the shaded pastel colors elsewhere in the city. The floor was covered with a soft and spongy material. On looking closer, the walls proved also to be padded. A room, one felt, in

which it would be difficult to hurt oneself.

Bhorka stopped just inside the door they had entered. Ter stepped in front of him, and turned to face the boy. "I am your friend, Bhorka. Help you need, and as your friend, I shall help you. But, so that I may help you, you must first help me. Now answer me with truth. Was it then from this room that you went to where I found you?"

"Yes." The boy's voice was barely audible.

"Where were you before here?"

The boy looked at the mathematician, pain twisting his face. "Nowhere."

"What do you mean, nowhere?"

Ter was softly insistent.

"I wasn't anywhere before I was here." The boy collapsed and huddled on the floor. Ter bent over and put a hand on his shoulder.

"That's all, Bhorka," he said. "I think you have told me all I need to know to be able to help you. Now wait, here, until I give you other orders." The boy gave no sign of having heard.

Tricky and Meik stood by the door. Her face was wiped of its usual mockery. There was only pity as she gazed at Bhorka, and fear and hate when she looked around the room. Meik stood, almost sullenly, his fists hanging at his sides, balanced on his toes. He seemed to dare the room to show hostility. There was something terrifying in knowing that this innocent room

was so awful to a boy.

Ter went over the wall, a finger width at a time. He peered at it, testing it with his finger. Suddenly a sharp gong sounded. The mathematician whirled. He looked at Bhorka. The boy, at the sound, had jumped to his feet.

"Stop him, Meik, if he makes a break," Ter called, curtly. The boy gave a wild scream and leaped for the door. Meik's fist landed on his chin. There was no weight behind the fist, and the padded floor cushioned his fall. But it was clear they would not have to worry about him further.

A second gong sounded. The lights went out. There was a moment of utter blackness and silence. Then, as if far away, there came the faint sound of twisting, tortured metal. A moaning came, as if there were a crowd of people near unconsciousness from pain. Faintly and far away, a man could be heard. A man who chuckled with sadistic gloating. The faint odor of burned flesh could be detected.

"Meik, give me some light." Ter's voice was steady and commanding. There was the sound of hurried fumbling before a beam stabbed out.

Tricky screamed at what she saw. Ter was still crouched where he had been by the side wall. But the far wall of the room had disappeared, leaving the room about twice its former size. The additional space was filled with perhaps forty persons, each about fifteen years old. Half naked,

they were, their bodies covered with bruises and livid welts. Their heads were bandaged and, in many cases blood streamed down over their faces. Their faces were twisted with pain and fear.

"Light off." Ter's voice was curt, impassive. Quickly Meik obeyed.

A moment later, there was a sudden high whine. It sliced through the darkness, cutting thought and paralyzing reflexes. And then it stopped, and a voice rasped out: "Now hear this. Hear this and let these words become a part of you that you shall not ever forget.

"You who are here have survived the Ordeal. Before you is the City." The voice became warm. "In it you will be happy. It will care for you and supply all that it is good and wise for you to have. In it you will dream of the time when the Purpose of the Builders shall have been fulfilled. Of the time when you who carry the inheritance of the Builders may find release from the Curse of the Fools.

"All that which has gone before has had no reality." The rasp returned to the voice. "It has been an evil dream and the inheritance of the Fools. A nightmare in which you have wandered blindly praying for the golden moment when you were chosen for the Ordeal. There is nothing there to which you would return. There cannot be for there is nothing there. The pain that you remember, the terror that still haunts you, were the pain and terror of creation. The memories that you

seem to have are false, and the illusion of creation. They will fall from you as must all untrue things. Do not seek to return. Deliver yourself wholly unto the City, and find in it the fulfillment of your Destiny. Dream and find the peace that will be yours."

The voice stopped and there was silence. Then, for the third time, the gong rang out. As its sound faded, soft music started. With it, the room gradually became lighted. Soft colors pulsed gently and chased each other over the walls. The room breathed an aura of peace.

When the visitors could see again, they found the room once more at its original size. In the far half, a pile of bodies lay jumbled where, apparently, the far wall had pushed them. A few were standing, or sitting, their faces numb with shock. But most just lay inertly.

Ter turned from where he stood and strode toward the others. Although to hurry seemed normal to him, there was something different, this time—an extra urgency. He looked at Bhorka still unconscious on the floor. "Take him out in the hall," he ordered Meik. When this was done, he almost danced around the boy. "Can't you do something to bring him to?" he asked Tricky.

She bent over the boy. From a case on her belt she pulled a small first-aid kit. She forced a pill into the boy's mouth, and then sat back to watch and wait for it to take effect.

"Can't you speed things up any?" Ter hopped from one foot to the other.

"What's eating you?" Tricky looked curious. "If I did not know you better, I'd say you were afraid."

Ter wet his lips. "I've thought of something I want," he said. "And please do not talk."

Tricky's eyes narrowed. "You are afraid." Her voice was incredulous, and almost delighted.

"Please do not talk," Ter almost shouted. "Just get Bhorka back on his feet."

Tricky put her hands on her hips. Obviously, she was meditating a suitably needling reply. Before she had settled on one, however, the boy on the floor stirred and moaned. He sat up, his eyes dazed. Suddenly, as memory returned, so did fear. He looked around wildly, and almost smiled in quick relief.

"Bhorka, please get on your feet." Ter's voice had recovered its calm. To a close observer, he was still tense, but none of it showed in his voice. Slowly, the boy obeyed the order. "Please take us back to your room," Ter ordered. He watched the boy closely. It was with some visible relief that he followed Bhorka when he led the way.

As far as they could tell, he led them back the same way they had come. Since all the corridors appeared the same, they could not tell for sure. But it did not matter. Whatever the route, they did come back to the same room. This they knew for outside the door the girl,

Trillia, still stood, exactly as they had left her.

As the boy started to enter his room, Ter stopped him. "Wait, Bhorka, please. You will please follow us." He turned to Trillia. "Trillia, it was I who told you to wait here until I should return to tell you otherwise. Is it not so?"

"It is so," she murmured, her eyes unfocused.

"It is so," he echoed. "And now I tell you to return to your room." Without a word she turned and drifted off. With a signal to the others, Ter followed.

As he had done with the boy, so did Ter stop the girl as she was about to enter her room. "Wait, Trillia, please. You will please now come with me." He strode down the way that led to the entrance to the city. Behind him came the boy and girl. Meik and Tricky followed.

When they reached the scout ship, Ter ordered the boy and girl to lie on the beds and sleep. Immediately, they did so. He turned to Meik, looking around with an air of satisfaction. "And, now, let's stow this ship for take-off."

"You leaving?" Tricky asked. She was puzzled.

"Yes." Ter's voice was curt.

She looked at him, the habitual mockery of her eyes suddenly bitter. "So you're running away? The boy who was going to find all the answers. The boy that just knew that everything anybody else was trying to do was wrong. Things

have finally got too tough have they? So you're just moving out?"

Ter looked at her with stunned amazement. "What are you talking about?"

"You," she bit at him. "I like fools who have the guts to tell people like Lar off. But I despise them when they run away right after."

"I'm not running away from Lar," he remonstrated.

"From the City, then. It makes no difference," she told him.

"It makes all the difference." The little man was beginning to get angry. "If you'd hold your tongue long enough to think a moment, you would not make such idiotic statements."

"A coward's a coward, no matter what he's afraid of," she sneered.

"You are afraid of the City," he pointed out grimly. "Would you mind telling me why my being afraid makes me a coward and you not?"

"You're leaving; I'm not."

"Why shouldn't I leave?"

"There's still work to be done, sonny." Her lips curled. "There's still the weapon to find. There's still the little problem of finding the gadget we need to save humanity from the Slugs. Have you forgotten that?"

Ter was quiet a moment. "So, I'm a coward." His voice was bland. "I'm a coward because I'm leaving. I'm leaving because I'm afraid of the City." His voice suddenly rose. "But it never occurs to you to ask whether maybe I've got the weapon,

does it?" He glared at her.

Tricky stared at him, open-mouthed. "What's this about the weapon?"

"I have the weapon," he said. The words were slow and deliberate.

Tricky was, for once, bereft of speech. She had been so sure that he was simply quitting, abandoning the search for the weapon in the face of the City's pressure, that she could not readjust immediately. "Where is it?" she finally asked.

Ter looked at her a moment. Then, suddenly, he strode over to her, picked her up, and threw her into a chair. "Sit there," he growled, "and keep your mouth shut. Don't say a word. For if you do, I'll bat you." He picked up a wrench and stood over her, glowering. "You are a truly remarkable woman, I know—especially for never-ending talk. But now, no matter how it hurts, you are going to keep still and listen. Do you see?"

When the initial surprise faded, her eyes started to twinkle. She folded her hands into a conventional gesture of submission.

Ter walked to the center of the room. "You want to see it do you?" She nodded. "How do you see an idea? What is a weapon, anyway? What is the difference between a gadget and the idea for a gadget? Or the science behind the idea? A lot of sweat and grief, perhaps. Time and even lives. But which is better, the science or the gadget?"

The gadget saves lives now. But soon the enemy will have it, too. Or find a way to answer it. But a science breeds a whole new race of gadgets. A new technology of war. A new gadget will save some lives, and even worlds. A new science will win the war for us. My weapon is a science." He stopped and peered at her.

"But you've got to understand," he continued. "It makes no sense unless you see the whole picture. So let me give it to you. We were talking here about my theory. I was trying to see the picture from the Builders' viewpoint. I said they had to make the city partly human. They could not make it run itself. They could not make a machine that would do what needed to be done, and last as long as it would have to last. Most of the city they could put to sleep, but some they had to keep awake to keep the central controls working. And yet this human factor could be deadly to the basic purpose. It would start experimenting. It would ask too many of the wrong questions. Like 'Why should we work and break our backs to keep these dreamers living?' It would lose its sense of purpose. And the city would fail. The Purpose would fail. There would be no human nucleus when the world became inhabitable again. This, I said, was the basic problem facing the Builders. Remember?" The girl nodded. So did Meik who was sitting in a corner screwing a nut on a

bolt with infinite deliberation while he listened.

"And then I asked you," Ter went on, "what kind of people the Builders needed for the job. Basically, the answer is simple. They needed people who would have unlimited enthusiasm for the job at hand. Who would not ever grow tired of it. But who would never look beneath the surface, and ask the basic 'why?' Never question their own relation to the whole, or even ask the nature of the whole itself. These people exist. In every civilization, they exist. Do you know who they are?"

"Lar?" Tricky asked.

Ter laughed. "Perhaps. But that is not what I meant. I talk of classes. Where in our civilization, does such a class exist?"

Tricky just looked puzzled and shook her head.

"Well, let me take another tack," Ter said. "These people here. The dreamers. Sleepwalkers. How do they get that way?" He held up his hand for silence. "And do not answer by citing the rhythms, and the light patterns. Babies are not born to sleep. And babies are adaptable. To us, adults, these rhythms are hypnotic. But let a child grow up in them, and he would never hear them. He would never be affected by them. Never would they put him into a trance. No. So that, you see, leaves wide open the question of why they are so very tranced."

"The answer actually was con-



tained in a book I was reading on the trip here. On cerebral micro-anatomy—the detailed structure of the brain. If you cut certain particular nerve tracks in the brain, you leave the individual with almost his full faculties—except that of initiative. He becomes wide open to suggestion. His own heart beat will hypnotize him. A race, each member of which had had these nerve tracks cut would be extremely susceptible to the rhythms of the City. The light patterns. The subsonic sound patterns. The pattern of the aromas in the air. The daily congregation to chant the Canon of the City. The race would be completely somnambulistic."

"Yes," Tricky nodded, "this could be. Only who does the opera-

tion? It must require a good deal of skill."

Ter shrugged. "Not, perhaps, as much as you might think. These nerve tracks are not too hard to get at. At least to judge by what the book says. And in judging an operation, you must not confuse difficulty with danger. One operation can be relatively easy—but apt to kill. Another one may be very difficult, but involve little risk to life. I would judge this belongs in the first category. The mortality rate may be high, but the actual dexterity involved may be less than that of, say, an appendectomy."

"Oh." The girl's mouth was open. "And we know the robot-doctors of the City can take out appendixes."

"Quite."

"But why would anyone let the City do this to them?" She looked shocked.

"Well, obviously, it is built up as an 'Ordeal,'" he answered. "As a purgatory through which you have to pass to reach the heaven of the City. This part of the City. It is a challenge. A test. And, probably, the candidates do not ever see the end results. Since, then, it is done while they are young and still open to a dare, and since to deny the challenge is to deny the principles on which they have been raised, there is probably very little chance of anyone resisting for very long."

"You think, then, that the group we saw down there had just had the operation? But they were all bloody and mangled. If the thing is such routine for the City, why is it done so horribly? Why the bloody bandages and the bruises? And why the sound effects? The moaning and the maniacal chuckling? The odor of burned flesh?"

"Simply to make it horrible, I suspect," Ter said. "To drive them away. To shock them so that they will not ever return. And it works. I could not get Trillia to take us back. Only Bhorka for whom the experience was still fresh and therefore almost in the conscious level as opposed to the deep subconscious to which it is eventually driven."

"Also, you will note, that pattern is used as the final whip by the City. When we go into an unused room and close the door, the City knows that something has gone out of con-

trol. A deviation from the norm has occurred. So it brings forth this same pattern—screeling gears, expression of pain, odor of burning flesh, and sadistic gloating. One of the curious things about this was that it was so unvarying. The same thing happened whenever we went into an unused room. We thought the City was detecting us as strangers. But actually it was just detecting a deviation. And its automatic response to a detected deviation is to use a much intensified form of the pattern of the environment in which the 'Ordeal' takes place. A whip to drive a possibly awakening individual back into trance. Or, failing that, to break him entirely."

"I guess that makes sense," Tricky admitted. "But so what? Where does it leave us?"

"It occurs to me," Ter said, "that you are doing too much talking." His voice was gentle but he picked up the wrench again. Tricky grinned and folded her hands meekly.

"So this gives us a sleepwalking race," Ter continued. "That is, after they've been through the 'Ordeal'. But where are they before the 'Ordeal'? And what are they doing?"

Tricky suddenly leaned forward. "Do you mean—?"

"Yes," he said. "This class of people I mentioned before who have unlimited enthusiasm but without the depth of penetration to question their environment itself—this class that every civilization has—is its children. A child has unlimited en-

ergy. When it becomes a youth, it can use that energy with great skill and dexterity. But it is characteristic of the immature that they do not ask the basic 'why?' They accept things as they are." He paused to let them absorb the idea. The idea that explained the City.

"So there's the pattern. The City takes the child as soon as he's born. It raises him and trains him to do what must be done—to repair the central computer or to do whatever it is the City cannot do for itself. And when the child begins to become an adult—when he might start thinking too deeply—when he gets dangerous to the Purpose—then he is granted the honor and privilege of submitting to the 'Ordeal'. And, by operative means, he is made unable to think for himself, or to resist suggestion. Then the shell that is left is sent to the outer City into its world of sleep-suggestive patterns and kept there to breed new generations to continue the incredibly vicious cycle."

"How perfectly horrible," Tricky said to herself.

"Yes," he agreed. "But what did you expect? The inhabitants of the City are insane. And insanity is always horrible."

Meik grunted. His hands twisted.

"Furthermore," Ter went on, "it did not work. The Plan of the Builders failed. For the children were too bright. They were too clever. They built up their science. But children are conservative. They do not like

new environments. They are willing to extend their pattern of life, but not to change it. So even though they developed a higher science, they used it neither to change their relation to the City, nor to change the City. Such is always the pattern of immature behavior."

"I see," Tricky nodded thoughtfully. "And also, when the time came for the City to end—when Torlinda was once again inhabitable—they prevented its breakdown. The City should have stopped. They prevented the awakening of the 'Phoenix.' And the City kept on—and on—and on. For about two thousand years longer than it should have."

"Yes," Ter agreed. "A pitiful irony, that they should work so hard and skillfully to maintain the cause of their adult insanity." The three of them fell into meditation on Ter's solution of the enigmas of the City.

"But," Tricky said after a few minutes, "the weapon?"

"The weapon?" Ter's eyes slowly focused. "Oh, yes. Our weapon—the weapon that humanity will use to drive the Slugs out of space—is there." Dramatically, he pointed to the sleeping boy and girl. "Those two. For the weapon is a science. I told you that. A new science, higher than anything we have. A science that can hold our cruiser pinned to the ground with some field we cannot even find. And they know that science. For they worked with it before they entered the 'Ordeal'."

"We will take them with us. Maybe our neuro-surgeons can

undo the damage that was done. At least our psychologists should be able to dig out some of their memories. Apparently, to judge by what the voice said down there, there has been no effort to remove the memories. Only to keep the dreamers from using them. So these two, or others like them, will give us our weapon."

Tricky stared, then chuckled. "So all the time our answer just kept getting in our way."

Ter nodded, smiling at the irony of the expedition's frustration.

Meik, from his corner, grunted. "Hey, boss. One thing you haven't said. Just why did they freeze the cruiser? Why did they tip their hand like that?"

"Maybe just playing tricks," Ter said. "Just children showing off their power. Or perhaps the field of the Drive bothered them. Interfered with whatever they were doing. So they canceled it out. And thereby fixed the cruiser. Until they tell us," he patted at the sleeping pair, "you can pick your answer."

"Which, incidentally," he continued after a moment, "is why I was afraid down there. There is nothing more dangerous than absolute power in the hands of the immature. And I was afraid that hall might be rigged to detect deviations from the norm."

The girl looked at him. "I called you a coward. I'm sorry. I was wrong." Her voice was soft.

Ter blushed and turned abruptly away. But he turned back. They

smiled at each other. Meik, from his corner, beamed. He knew he was forgotten in the glow of mutual understanding they had found. But he did not care.

The interlude of peace, however, was not long. The burly leader of the expedition, Lar, came stomping in. He glowered around, and, in particular, at Tricky. "So here you are," he growled at her. "I might have known. I've been looking for you all day. I looked in all the state-rooms of our ship, but I should have looked here, too." He sneered. "In fact, I should have looked here first. These are new faces."

Tricky went white. Ter's eyes slitted. "Your tongue is out of control. Please get out." His voice was cold. Icy.

"Stay out of this, sonny," Lar brushed him off. "This is between me and my, ah, secretary."

"I have no intention of staying out," Ter answered. "And she's your ex. ah, secretary. She's leaving with me."

Tricky smiled at him. "Don't I have a voice in that?" Her voice was gentle in spite of her words.

Ter looked at her and smiled. "I suppose so. But aren't you? After all, I love you and you love me. Don't you?"

"Yes," she answered simply. But her eyes said much more.

Lar looked as if he might explode. "You little meddling, nosy—if that girl leaves with you, you can count yourself washed up. I've got

plenty of influence with the Commission, see." He stuck his face down close to Ter's. "And as for her loving you—"

Ter's face was white. But his fist whipped up. The blow did little damage, but it must have hurt. Lar roared, and came in swinging. Ter started forward, too. But he did not get there. He felt himself hurled backwards, by a hand at his collar. He saw Meik's fist meet Lar. That blow, with Meik's huge weight behind it, not only hurt, but damaged. It threw Lar back across the cabin.

Meik moved forward, crouched. His face was savage. Lar scrambled out of the way, through the door. "You'll pay for this," the leader snarled. "I'll see you're blacklisted everywhere you try to work."

Meik stood up from his crouch.

The anger left his face, and it became bland. "I wouldn't advise it." His voice was unexpectedly cultured. "Aside from being an ion-jet jockey, I am also an investigator from the Commission. Your uncle, the Commissioner himself, sent me to check on you. He told me he was willing to get you a job—once. But that—after that—it was strictly up to you. If you should fail, he wouldn't use his influence to get you hired as a stevedore. He wanted me to find out if you had failed. I regret to say that in my opinion you have." He turned and touched the button to close the hatch.

A while later, when seated in the pilot's chair, Meik called to the other two. "If you can break it up for a little while," he said, grinning, "we'll go see a couple of stars."

THE END

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COURTESY

BY CLIFFORD D. SIMAK

When the mighty Earthmen arrive in their ships of space, courtesy and proper humility on the part of the natives is expected. But some native inhabitants are too small to be impressed —

Illustrated by Cartier

The serum was no good. The labels told the story.

Dr. James H. Morgan took his glasses off and wiped them carefully, cold terror clutching at his innards. He put the spectacles back on, probing at them with a thick, blunt finger to settle them into correct position. Then he took another look. He had been right the first time. The date on the serum consignment was a good ten years too old.

He wheeled slowly, lumbered a few ponderous steps to the tent flap and stood there, squat body framed in the triangular entrance, pudgy hands gripping the canvas on either side.

Outside the fantastic lichen moors

stretched to gray and bleak horizons. The setting sun was a dull red glow in the west and to the east, the doctor knew, night already was beginning to close in, with that veil of purplish light that seemed to fall like a curtain upon the land and billow rapidly across it.

A chill wind blew out of the east, already touched with the fridity of night, and twitched the canvas beneath the doctor's fingers.

"Ah, yes," said Dr. Morgan, "the merry moors of Landro."

A lonely place, he told himself. Not lonely only in its barrenness nor in its alien wildness, but with an ingrained loneliness that could drive a man mad if he were left alone with it.



Like a great cemetery, he thought, an empty place of dead. And yet without the cemetery's close association, without the tenderness and the inevitability of a cemetery. For a cemetery held in sacred trust the husks of those who once had lived and this place was an emptiness that held no memory at all.

But not for long, said Dr. Morgan. Not for long now.

He stood looking at the barren slope that rose above the camp and he decided that it would make an eminently satisfactory cemetery.

All places looked alike. That was the trouble. You couldn't tell one place from another. There were no trees and there were no bushes, just

a fuzzy-looking scrub that grew here and there, clothing the naked land in splotches, like the ragged coat that a beggar wears.

Benny Falkner stopped on the path as it topped the rise and stood rigid with the fear that was mounting in him. Fear of the coming night and of its bitter cold, fear of the silent hills and the shadowed swales, and the more distant and yet more terrible fear of the little natives that might this very moment be skulking on the hillside.

He put up his arm and wiped the sweat off his brow with his tattered sleeve. He shouldn't have been sweating, he told himself, for it was chilly now and getting colder by the minute. In another hour or two it

would be cold enough to freeze a man unprotected in the open.

He fought down the terror that choked his throat and set his teeth a-chatter and for an instant stood stock-still to convince himself he was not panic-stricken.

He had been going east and that meant he must go west to reach the camp again. Although the catch was that he couldn't be absolutely sure he had been going east all the time—he might have trended north a little or even wandered south. But the deviation couldn't have been enough, he was sure, to throw him so far off that he could not spot the camp by returning straight into the west.

Sometime soon he should sight the smoke of the Earthmen's camp. Any ridge, the next ridge, each succeeding hummock in the winding trail, he had assured himself, would bring him upon the camp itself. He would reach higher ground and there the camp would be, spread out in front of him, with the semicircle of white canvas gleaming in the fading light and the thin trail of smoke rising from the larger cook tent where Bat Ears Brady would be following one of his obscene songs.

But that had been an hour ago when the sun still stood a good two hands high. He remembered now, standing on the ridge-top, that he had been a little nervous, but not really apprehensive. It had been unthinkable, then, that a man could get himself lost in an hour's walk out of camp.

Now the sun was gone and the

cold was creeping in and the wind had a lonely sound he had not noticed when the light was good.

One more rise, he decided. One more ridge, and if that is not the one, I'll give up until morning. Find a sheltered place somewhere, a rock face of some sort that will give me some protection and reflect a campfire's heat—if I can find anything with which to make a campfire.

He stood and listened to the wind moaning across the land behind him and it seemed to him there was a whimper in the sound, as if the wind were anxious, that it might be following on his track, sniffing out his scent.

Then he heard the other sound, the soft, padding sound that came up the hill toward him.

Ira Warren sat at his desk and stared accusingly at the paper work stacked in front of him. Reluctantly he took some of the papers off the stack and laid them on the desk.

That fool Falkner, he thought. I've told them and I've told them that they have to stick together, that no one must go wandering off alone.

A bunch of babies, he told himself savagely. Just a bunch of drooling kids, fresh out of college, barely dry behind the ears and all hopped up with erudition, but without any common sense. And not a one of them would listen. That was the worst of it, not a one of them would listen.

Someone scratched on the canvas of the tent.

"Come in," called Warren.

Dr. Morgan entered.

"Good evening, commander," he said.

"Well," said Warren irritably, "what now?"

"Why, now," said Dr. Morgan, sweating just a little. "It's the matter of the serum."

"The serum?"

"The serum," said Dr. Morgan.

"It isn't any good."

"What do you mean?" asked Warren. "I have troubles, doctor. I can't play patty-cake with you about your serum."

"It's too old," said Morgan. "A good ten years too old. You can't use old serum. You see, it might—"

"Stop chattering," commanded Warren, sharply. "The serum is too old, you say. When did you find this out?"

"Just now."

"You mean this very moment?"

Morgan nodded miserably.

Warren pushed the papers to one side very carefully and deliberately. He placed his hands on the desk in front of him and made a tent out of his fingers.

"Tell me this, doctor," said Warren, speaking cautiously, as if he were hunting in his mind for the exact words which he must use, "how long has this expedition been on Landro?"

"Why," said Morgan, "quite some time, I'd say." He counted mental fingers. "Six weeks, to be exact."

"And the serum has been here all that time?"

"Why, of course," said Morgan. "It was unloaded from the ship at the same time as all the other stuff."

"It wasn't left around somewhere, so that you just found it? It was taken to your tent at once?"

"Of course it was," said Morgan. "The very first thing. I always insist on that procedure."

"At any time in the last six weeks, at any given moment in any day of that whole six weeks, you could have inspected the serum and found it was no good? Isn't that correct, doctor?"

"I suppose I could have," Morgan admitted. "It was just that—"

"You didn't have the time," suggested Warren, sweetly.

"Well, not that," said Morgan.

"You were, perhaps, too pressed with other interests?"

"Well, not exactly."

"You were aware that up to a week ago we could have contacted the ship by radio and it could have turned back and took us off. They would have done that if we had let them know about the serum."

"I know that—"

"And you know now that they're outside our radio range. We can't let them know. We can't call them back. We won't have any contact with the human race for the next two years."

"I," said Morgan, weakly, "I—"

"It's been lovely knowing you," Warren told him. "Just how long do

you figure it will be before we are dead?"

"It will be another week or so before we'll become susceptible to the virus," Morgan said. "It will take, in certain stubborn cases, six weeks or so for it to kill a man."

"Two months," said Warren. "Three, at the outside. Would you say that was right, Dr. Morgan?"

"Yes," said Morgan.

"There is something that I want you to tell me," Warren said.

"What is it?" Morgan asked.

"Sometime when you have a moment, when you have the time and it is no inconvenience to you, I should like to know just how it feels to kill twenty-five of your fellow men."

"I," said Morgan, "I—"

"And yourself, of course," said Warren. "That makes twenty-six."

Bat Ears Brady was a character. For more than thirty years now he had been going out on planetary expeditions with Commander Ira Warren, although Warren had not been a commander when it started, but a second looney. Today they were still together, a team of toughened planet-checkers. Although no one on the outside would have known that they were a team, for Warren headed the expeditions and Bat Ears cooked for them.

Now Warren set out a bottle on his desk and sent for Bat Ears Brady.

Warren heard him coming for some time before he finally arrived.

He'd had a drink or two too many and he was singing most obscenely.

He came through the tent entrance walking stiff and straight, as if there were a chalked line laid out for him to follow. He saw the bottle on the desk and picked it up, disregarding the glasses set beside it. He lowered the bottle by a good three inches and set it back again. Then he took the camp chair that had been placed there for him.

"What's the matter now?" he demanded. "You never send for me unless there's something wrong."

"What," asked Warren, "have you been drinking?"

Bat Ears hiccuped politely. "Little something I cooked up."

He regarded Warren balefully. "Use to be we could bring in a little something, but now they say we can't. What little there is you keep under lock and key. When a man gets thirsty, it sure tests his ingen . . . ingen . . . ingen—"

"Ingenuity," said Warren.

"That's the word," said Bat Ears. "That's the word, exactly."

"We're in a jam, Bat Ears," said Warren.

"We're always in a jam," said Bat Ears. "Ain't like the old days, Ira. Had some he-men then. But now—"

"I know what you mean," said Warren.

"Kids," said Bat Ears, spitting on the floor in a gesture of contempt. "Scarcely out of didies. Got to wipe their noses and—"

"It isn't that kind of a jam," said

Warren. "This is the real McCoy. If we can't figure this one out, we'll all be dead before two months are gone."

"Natives?" asked Bat Ears.

"Not the natives," Warren told him. "Although more than likely they'd be glad to do us in if there was a chance."

"Cheeky customers," said Bat Ears. "One of them sneaked into the cook tent and I kicked him off the reservation real unceremonious. He did considerable squalling at me. He didn't like it none."

"You shouldn't kick them, Bat Ears."

"Well, Ira, I didn't really kick him. That was just a figure of speech, kind of. No sir, I didn't kick him. I took a shovel to him. Always could handle a shovel some better than my feet. Reach farther and—"

He reached out and took the bottle, lowered it another inch or two.

"This crisis, Ira?"

"It's the serum," Warren told him. "Morgan waited until the ship had got too far for us to contact them before he thought to check the serum. And it isn't any good—it's about ten years too old."

Bat Ears sat half stunned.

"So we don't get our booster shots," said Warren, "and that means that we will die. There's this deadly virus here, the . . . the . . . oh, well, I can't remember the name of it. But you know about it."

"Sure," said Bat Ears. "Sure I know about it."

"Funny thing," said Warren.

"You'd expect to find something like that on one of the jungle planets. But, no, you find it here. Something about the natives. They're humanoid. Got the same kind of guts we got. So the virus developed an ability to attack a humanoid system. We are good, new material for it."

"It don't seem to bother the natives none now," said Bat Ears.

"No," said Warren. "They seem to be immune. One of two things: They've found a cure or they've developed natural immunity."

"If they've found a cure," said Bat Ears, "we can shake it out of them."

"And if they haven't," said Warren, "if adaptation is the answer—then we're dead ducks for sure."

"We'll start working on them," said Bat Ears. "They hate us and they'd love to see us croak, but we'll find some way to get it out of them."

"Everything always hates us," Warren said. "Why is that, Bat Ears? We do our best and they always hate us. On every planet that Man has set a foot on. We try to make them like us, we do all we can for them. But they resent our help. Or reject our friendliness. Or take us for a bunch of suckers—so that finally we lose our patience and we take a shovel to them."

"And then," said Bat Ears, sanctimoniously, "the fat is in the fire."

"What I'm worried about is the men," said Warren. "When they hear about this serum business—"

"We can't tell them," said Bat

Ears. "We can't let them know. They'll find out, after a while, of course, but not right away."

"Morgan is the only one who knows," said Warren, "and he blabs. We can't keep him quiet. It'll be all over camp by morning."

Bat Ears rose ponderously. He towered over Warren as he reached out a hand for the bottle on the desk.

"I'll drop in on Morgan on my way back," he said. "I'll fix it so he won't talk."

He took a long pull at the bottle and set it back.

"I'll draw a picture of what'll happen to him if he does," said Bat Ears.

Warren sat easily in his chair, watching the retreating back of Bat Ears Brady. Always there in a pinch, he thought. Always a man that you can depend on.

Bat Ears was back in three minutes flat. He stood in the entrance of the tent, no sign of drunkenness upon him, his face solemn, eyes large with the thing he'd seen.

"He croaked himself," he said.

That was the solemn truth.

Dr. James H. Morgan lay dead inside his tent, his throat sliced open with a professional nicety that no one but a surgeon could have managed.

About midnight the searching party brought in Falkner.

Warren stared wearily at him. The kid was scared. He was all scratched up from floundering

around in the darkness and he was pale around the gills.

"He saw our light, sir," said Peabody, "and let out a yell. That's the way we found him."

"Thank you, Peabody," said Warren. "I'll see you in the morning. I want to talk to Falkner."

"Yes, sir," said Peabody. "I am glad we found him, sir."

Wish I had more like him, thought Warren. Bat Ears, the ancient planet-checker; Peabody, an old army man, and Gilmer, the grizzled supply officer. Those are the ones to count on. The rest of them are punks.

Falkner tried to stand stiff and straight.

"You see, sir," he told Warren, "it was like this: I thought I saw an outcropping—"

Warren interrupted him. "You know, of course, Mr. Falkner, that it is an expedition rule you never are to go out by yourself; that under no circumstance is one to go off by himself."

"Yes, sir," said Falkner, "I know that—"

"You are aware," said Warren, "that you are alive only by some incredible quirk of fate. You would have frozen before morning if the natives hadn't got you first."

"I saw a native, sir. He didn't bother me."

"You are more than lucky, then," said Warren. "It isn't often that a native hasn't got the time to spare to slit a human's throat. In the five

expeditions that have been here before us, they have killed a full eighteen. Those stone knives they have, I can assure you, make very ragged slitting."

Warren drew a record book in front of him, opened it and made a very careful notation.

"Mr. Falkner," he said, "you will be confined to camp for a two-week period for infraction of the rules. Also, during that time, you shall be attached to Mr. Brady."

"Mr. Brady, sir? The cook?"

"Precisely," said Warren. "He probably shall want you to hustle fuel and help with the meals and dispose of garbage and other such light tasks."

"But I was sent on this expedition to make geologic observations, not to help the cook."

"All very true," admitted Warren. "But, likewise, you were sent out under certain regulations. You have seen fit to disregard those regulations and I see fit, as a result, to discipline you. That is all, Mr. Falkner."

Falkner turned stiffly and moved toward the tent flap.

"By the way," said Warren, "I forgot to tell you. I'm glad that you got back."

Falkner did not answer.

Warren stiffened for a moment, then relaxed. After all, he thought, what did it matter? With another few weeks nothing would matter for him and Falkner, not for any of the rest.

The chaplain showed up the first thing in the morning. Warren was sitting on the edge of his cot, pulling on his trousers when the man came in. It was cold and Warren was shivering despite the sputtering of the little stove that stood beside the desk.

The chaplain was very precise and businesslike about his visit.

"I thought I should talk with you," he said, "about arranging services for our dear departed friend."

"What dear departed friend?" asked Warren, shivering and pulling on a shoe.

"Why, Dr. Morgan, of course."

"I see," said Warren. "Yes, I suppose we shall have to bury him." The chaplain stiffened just a little.

"I was wondering if the doctor had any religious convictions, any sort of preference."

"I doubt it very much," said Warren. "If I were, you, I'd hold it down to minimum simplicity."

"That's what I thought," said the chaplain. "A few words, perhaps, and a simple prayer."

"Yes," said Warren. "A prayer, by all means. We'll need a lot of prayer."

"Pardon me, sir?"

"Oh," Warren told him, "don't mind me. Just wool-gathering, that's all."

"I see," said the chaplain. "I was wondering, sir, if you have any idea what might have made him do it."

"Who do what?"

"What made the doctor commit suicide."

"Oh, that," said Warren. "Just an unstable character, I guess."

He laced his shoes and stood up. "Mr. Barnes," he said, "you are a man of God, and a very good one from what I've seen of you. You may have the answer to a question that is bothering me."

"Why," said Mr. Barnes, "why I—"

"What would you do," asked Warren, "if you suddenly were to find you had no more than two months to live?"

"Why," said Mr. Barnes, "I suppose that I would go on living pretty much the way I always have. With a little closer attention to the condition of my soul, perhaps."

"That," said Warren, "is a practical answer. And, I suppose, the most reasonable that anyone can give."

The chaplain looked at him curiously. "You don't mean, sir—"

"Sit down, Barnes," said Warren. "I'll turn up the stove. I need you now. To tell you the solemn truth, I've never held too much with this business of having you fellows with the expedition. But I guess there always will be times when one needs a man like you."

The chaplain sat down.

"Mr. Barnes," said Warren, "that was no hypothetical question I asked. Unless God performs some miracle we'll all be dead in another two months' time."

"You are joking, sir."

"Not at all," said Warren. "The serum is no good. Morgan waited to check it until it was too late to get word to the ship. That's why he killed himself."

He watched the chaplain closely and the chaplain did not flinch.

"I was of a mind," said Warren, "not to tell you. I'm not telling any of the others—not for a while, at least."

"It takes a little while," said Mr. Barnes, "to let a thing like that soak in. I find it so, myself. Maybe you should tell the others, let them have a chance—"

"No," said Warren.

The chaplain stared at him. "What are you hoping for, Warren? What do you expect to happen?"

"A miracle," said Warren.

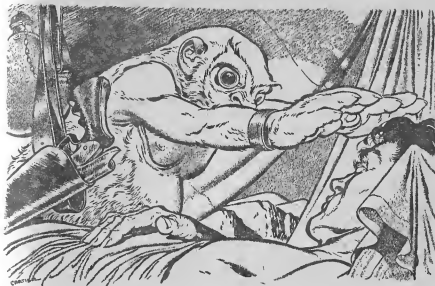
"A miracle?"

"Certainly," said Warren. "You believe in miracles. You must."

"I don't know," said Mr. Barnes. "There are certain miracles, of course—one might call them allegorical miracles, and sometimes men read into them more than was ever meant."

"I am more practical than that," said Warren, harshly. "There is the miracle of the fact that the natives of this place are humanoid like ourselves and they don't need any booster shots. There is a potential miracle in the fact that only the first humans who landed on the planet ever tried to live on Landrò without the aid of booster shots."

"Since you mention it," said the



chaplain, "there is the miracle of the fact that we are here at all."

Warren blinked at him. "That's right," he said. "Tell me, why do you think we're here? Divine destiny, perhaps. Or the immutable performance of the mysterious forces that move Man along his way."

"We are here," said Barnes, "to carry on the survey work that has been continued thus far by parties here before us."

"And that will be continued," said Warren, "by the parties that come after us."

"You forget," the chaplain said, "that all of us will die. They will be very wary of sending another expedition to replace one that has been wiped out."

"And you," said Warren, "forget the miracle."

The report had been written by the psychologist who had accompanied the third expedition to Landrò. Warren had managed, after considerable digging in the file of quadruplicates, to find a copy of it.

"Hog wash," he said and struck the papers with his fist.

"I could of told you that," said Bat Ears, "before you ever read it. Ain't nothing one of them prissy punks can tell an old-timer like me about these abor . . . abor . . . abor—"

"Aborigines," said Warren.

"That's the word," said Bat Ears. "That's the word I wanted."

"It says here," declared War-

ren, "that the natives of Landro have a keen sense of dignity, very delicately tuned—that's the very words it uses—and an exact code of honor when dealing among themselves."

Bat Ears snorted and reached for the bottle. He took a drink and slobbered what was left in the bottom discontentedly.

"You sure," he asked, "that this is all you got?"

"You should know," snapped Warren.

Bat Ears wagged his head. "Comforting thing," he said. "Mighty comforting."

"It says," went on Warren, "that they also have a system of what amounts to protocol, on a rather primitive basis."

"I don't know about this protocol-whatever-you-may-call-it," said Bat Ears, "but that part about the code of honor gets me. Why, them dirty vultures would steal the pennies off a dead man's eyes. I always keep a shovel handy and when one of them shows up—"

"The report," said Warren, "goes into that most exhaustively. Explains it."

"Ain't no need of explanation," insisted Bat Ears. "They just want what you got, so they sneak in and take it."

"Says it's like stealing from a rich man," Warren told him. "Like a kid that sees a field with a million melons in it. Kid can't see anything wrong with taking one melon out of all that million."

"We ain't got no million melons," said Bat Ears.

"It's just an analogy," said Warren. "The stuff we have here must look like a million melons to our little friends."

"Just the same," protested Bat Ears, "they better keep out of my cook tent—"

"Shut up," said Warren savagely. "I get you here to talk with you and all you do is drink up my liquor and caterwaul about your cook tent."

"All right," said Bat Ears. "All right. What do you want to know?"

"What are we doing about contacting the natives?"

"Can't contact them," said Bat Ears, "if we can't find them. They were around here, thicker than fleas, before we needed them. Now that we need them, can't find hide nor hair of one."

"As if they might know that we needed them," said Warren.

"How would they know?" asked Bat Ears.

"I can't tell you," Warren said. "It was just a thought."

"If you do find them," asked Bat Ears, "how you going to make them talk?"

"Bribe them," said Warren. "Buy them. Offer them anything we have."

Bat Ears shook his head. "It won't work. Because they know all they got to do is wait. If they just wait long enough, it's theirs without the asking. I got a better way."

"Your way won't work, either."

"You're wasting your time, anyhow," Bat Ears told him. "They ain't got no cure. It's just adap . . . adap—"

"Adaptation."

"Sure," said Bat Ears. "That's the word I meant."

He took up the bottle, shook it, measured it with his thumb and then, in a sudden gesture, killed it.

He rose quickly to his feet. "I got to sling some grub together," he said. "You stay here and get her figured out."

Warren sat quietly in the tent, listening to his footsteps going across the compound of the camp.

There was no hope, of course. He must have known that all along, he told himself, and yet he had postponed the realization of it. Postponed it with talk of miracles and hope that the natives might have the answer—and the native answer, the native cure, he admitted now, was even more fantastic than the hope of a miracle. For how could one expect the little owl-eyed people would know of medicine when they did not know of clothing, when they still carried rudely-chipped stone knives, when their campfire was a thing very laboriously arrived at by the use of stricken flint?

They would die, all twenty-five of them, and in the days to come the little owl-eyed natives would come boldly marching in, no longer skulking, and pick the camp to its last bare bone.

Collins was the first to go. He died hard, as all men die hard when infected by the peculiar virus of Landro. Before he was dead, Peabody had taken to his bed with the dull headache that heralded the onset of the malady. After that the men went down like ten pins. They screamed and moaned in delirium, they lay as dead for days before they finally died while the fever ate at them like some ravenous animal that had crept in from the moors.

There was little that anyone could do. Make them comfortable, keep them bathed and the bedding washed and changed, feed them broth that Bat Ears made in big kettles on the stove, be sure there was fresh, cold water always available for the fever-anguished throats.

At first the graves were deep and wooden crosses were set up, with the name and other information painted on the cross bar. Then the graves were only shallow holes because there were less hands to dig them and less strength within the hands.

To Warren it was a nightmare of eternity—a ceaseless round of caring for his stricken men, of helping with the graves, of writing in the record book the names of those who died. Sleep came in snatches when he could catch it or when he became so exhausted that he tottered in his tracks and could not keep his eyelids open. Food was something that Bat Ears brought and set in front of him and he gulped without know-

ing what it was, without tasting what it was.

Time was a forgotten thing and he lost track of days. He asked what day it was and no one knew nor seemed to care. The sun came up and the sun went down and the moors stretched to their gray horizons, with the lonely wind blowing out of them.

Vaguely he became aware of fewer and fewer men who worked beside him, of fewer stricken men upon the cots. And one day he sat down in his tent and looked across at another haggard face and knew it was nearly over.

"It's a cruel thing, sir," said the haggard face.

"Yes, Mr. Barnes," said Warren. "How many are there left?"

"Three," said the chaplain, "and two of them are nearly gone. Young Falkner seems to be better, though."

"Any on their feet?"

"Bat Ears, sir. Just you and I and Bat Ears."

"Why don't we catch it, Barnes? Why are we still here?"

"No one knows," the chaplain told him. "I have a feeling that we'll not escape it."

"I know," said Warren. "I have that feeling, too."

Bat Ears lumbered into the tent and set a pail upon the table. He reached into it and scooped out a tin cup, dripping, and handed it to Warren.

"What is it, Bat Ears?" Warren asked.

"Something I cooked up," said

Bat Ears. "Something that you need."

Warren lifted the cup and gulped it down. It burned its way clear into his stomach, set his throat afire and exploded in his head.

"Potatoes," said Bat Ears. "Spuds make powerful stuff. The Irish found that out, years and years ago."

He took the cup from Warren, dipped it again and handed it to Barnes.

The chaplain hesitated. Bat Ears shouted at him. "Drink it, man. It'll put some heart in you."

The minister drank, choked, set the cup back on the table empty.

"They're back again," said Bat Ears.

"Who's back?" asked Warren.

"The natives," said Bat Ears. "All around us, waiting for the end of us."

He disdained the cup, lifted the pail in both his hands and put it to his lips. Some of the liquor splashed out of the corners of his mouth and ran darkly down his shirt.

He put the pail back on the table, wiped his mouth with a hairy fist.

"They might at least be decent about it," he declared. "They might at least keep out of sight until it is all over. Caught one sneaking out of Falkner's tent. Old gray buck. Tried to catch him, but he outlegged me."

"Falkner's tent?"

"Sure. Snooping around before a man is dead. Not even waiting till he's gone. Didn't take nothing, though, I guess. Falkner was asleep.

Didn't even wake him."

"Asleep? You sure?"

"Sure," said Bat Ears. "Breathing natural. I'm going to unsling my gun and pick off a few of them, just for luck. I'll teach them—"

"Mr. Brady," asked Barnes, "you are certain Falkner was sleeping naturally? Not in a coma? Not dead?"

"I know when a man is dead," yelled Bat Ears.

Jones and Webster died during the night. Warren found Bat Ears in the morning, collapsed beside his stone-cold stove, the empty liquor pail beside him. At first he thought the cook was only drunk and then he saw the signs upon him. He hauled him across the floor and boosted him onto his cot, then went out to find the chaplain.

He found him in the cemetery, wielding a shovel, his hands red with broken blisters.

"It won't be deep," said Mr. Barnes, "but it will cover them. It's the best that I can do."

"Bat Ears has it," Warren told him.

The chaplain leaned on his shovel, breathing a little hard from digging.

"Queer," he said. "Queer, to think of him. Of big, brawling Bat Ears. He was a tower of strength."

Warren reached for the shovel.

"I'll finish this," he said, "if you'll go down and get them ready. I can't . . . I haven't the heart to handle them."

The chaplain handed over the shovel. "It's funny," he said, "about young Falkner."

"You said yesterday he was a little better. You imagined it?"

Barnes shook his head. "I was in to see him. He's awake and lucid and his temperature is down."

They stared at one another for a long time, each trying to hide the hope that might be upon his face.

"Do you think—"

"No, I don't," said Barnes.

But Falkner continued to improve. Three days later he was sitting up. Six days later he stood with the other two beside the grave when they buried Bat Ears.

And there were three of them. Three out of twenty-six.

The chaplain closed his book and put it in his pocket. Warren took up the shovel and shoveled in the dirt. The other two watched him silently as he filled the grave, slowly, deliberately, taking his time, for there was no other task to hurry him—filled it and mounded it and shaped it neat and smooth with gentle shovel pats.

Then the three of them went down the slope together, not arm in arm, but close enough to have been arm in arm—back to the white tents of the camp.

Still they did not talk.

It was as if they understood for the moment the dedicatory value of the silence that lay upon the land and upon the camp and the three that were left out of twenty-six.

Falkner said: "There is nothing strange about me. Nothing different than any other man."

"There must be," insisted Warren. "You survived the virus. It hit you and you came out alive. There must be a reason for it."

"You two," said Falkner, "never even got it. There must be some reason for that, too."

"We can't be sure," said Chaplain Barnes, speaking softly.

Warren rustled his notes angrily. "We've covered it," he said. "Covered everything that you know, everything that you can remember—unless you are holding back something that we should know."

"Why should I hold back anything?" demanded Falkner.

"Childhood history," said Warren. "The usual things. Measles, a slight attack of whooping cough, colds—afraid of the dark. Ordinary eating habits, normal acceptance of schools and social obligations. Everything as if it might be someone else. But there has to be an answer. Something that you did—"

"Or," said Barnes, "even something that he thought."

"Huh?" asked Warren.

"The ones who could tell us are out there on the slope," said Barnes. "You and I, Warren, are stumbling along a path we are not equipped to travel. A medical man, a psychologist, even an alien psychologist, a statistician—any one of them would have had something to contribute. But they are dead. You and I are trying to do something we have no

training for. We might have the answer right beneath our noses and we would not recognize it."

"I know," said Warren. "I know. We only do the best we can."

"I have told you everything I can," said Falkner, tensely. "Everything I know. I've told you things I would not tell under any other circumstance."

"We know, lad," said Barnes gently. "We know you have."

"Somewhere," persisted Warren, "somewhere in the life of Benjamin Falkner there is an answer—an answer to the thing that Man must know. Something that he has forgotten. Something that he has not told us, unintentionally. Or, more than likely, something that he has told us and we do not recognize."

"Or," said Barnes, "something that no one but a specialist could know. Some strange quirk in his body or his mind. Some tiny mutation that no one would suspect. Or even . . . Warren, you remember, you talked to me about a miracle."

"I'm tired of it," Falkner told them. "For three days now you have gone over me, pawed me, questioned me, dissected every thought—"

"Let's go over that last part again," said Warren wearily. "When you were lost."

"We've gone over it," said Falkner, "a hundred times already."

"Once again," said Warren. "Just once again. We were standing there, on the path, you say, when you heard the footsteps coming up the path."

"Not footsteps," said Falkner. "At first I didn't know they were footsteps. It was just a sound."

"And it terrified you?"

"It terrified me."

"Why?"

"Well, the dark, and being lost and—"

"You'd been thinking about the natives?"

"Well, yes, off and on."

"More than off and on?"

"More than off and on," Falkner admitted. "All the time, maybe. Ever since I realized I was lost, perhaps. In the back of my mind."

"Finally you realized they were footsteps?"

"No. I didn't know what they were until I saw the native."

"Just one native?"

"Just one. An old one. His coat was all gray and he had a scar across his face. You could see the jagged white line."

"You're sure about that scar?"

"Yes."

"Sure about his being old?"

"He looked old. He was all gray. He walked slowly and he had a limp."

"And you weren't afraid?"

"Yes, afraid, of course. But not as afraid as I would have expected."

"You would have killed him if you could?"

"No, I wouldn't have killed him."

"Not even to save your life?"

"Oh, sure. But I didn't think of that. I just . . . well, I just didn't want to tangle with him, that is all."

"You got a good look at him?"

"Yes, a good look. He passed me, no farther away than you are now."

"You would recognize him again if you saw him?"

"I did recognize—"

Falkner stopped, befuddled.

"Just a minute," he said. "Just a minute now."

He put up his hand and rubbed hard against his forehead. His eyes suddenly had a stricken look.

"I did see him again," he said. "I recognized him. I know it was the same one."

Warren burst out angrily. "Why didn't you tell—"

But Barnes rushed in and headed him off:

"You saw him again. When?"

"In my tent. When I was sick. I opened my eyes and he was there, in front of me."

"Just standing there?"

"Standing there and looking at me. Like he was going to swallow me with those big yellow eyes of his. Then he . . . then he—"

They waited for him to remember.

"I was sick," said Falkner. "Out of my head, maybe. Not all there. I can't be sure. But it seemed that he stretched out his hands, his paws, rather—that he stretched them out and touched me, one paw on each side of my head."

"Touched you? Actually, physically touched you?"

"Gently," said Falkner. "Ever so gently. Just for an instant. Then I went to sleep."

"We're ahead of our story,"

Warren said, impatiently. "Let's go back to the trail. You saw the native—"

"We've been over that before," said Falkner bitterly.

"We'll try it once again," Warren told him. "You say the native passed quite close to you when he went by. You mean that he stepped out of the path and circled past you—"

"No," said Falkner, "I don't mean that at all. I was the one who stepped out of the path."

You must maintain human dignity, the manual said. Above all else, human dignity and human prestige must be upheld. Kindness, yes. And helpfulness. And even brotherhood. But dignity was ahead of all.

And too often human dignity was human arrogance.

Human dignity did not allow you to step out of the path. It made the other thing step out and go around you. By inference, human dignity automatically assigned all other life to an inferior position.

"Mr. Barnes," said Warren, "it was the laying on of hands."

The man on the cot rolled his head on the pillow and looked at Warren, almost as if he were surprised to find him there. The thin lips worked in the pallid face and the words were weak and very slow in coming.

"Yes, Warren, it was the laying on of hands. A power these creatures have. Some Christ-like power

that no human has."

"But that was a divine power."

"No, Warren," said the chaplain, "not necessarily. It wouldn't have to be. It might be a very real, a very human power, that goes with mental or spiritual perfection."

Warren hunched forward on his stool. "I can't believe it," he said. "I simply can't. Not those owl-eyed things."

He looked up and glanced at the chaplain. Barnes' face had flushed with sudden fever and his breath was fluttery and shallow. His eyes were closed and he looked like a man already dead.

There had been that report by the third expedition's psychologist. It had said dignity and an exact code of honor and a rather primitive protocol. And that, of course, would fit.

But Man, intent upon his own dignity and his own prestige, had never accorded anyone else any dignity. He had been willing to be kind if his kindness were appropriately appreciated. He stood ready to help if his help were allowed to stand as a testament to his superiority. And here on Landro he had scarcely bothered to be either kind or helpful, never dreaming for a moment that the little owl-eyed native was anything other than a stone age creature that was a pest and nuisance and not to be taken too seriously even when he turned out, at times, to be something of a menace.

Until one day a frightened kid

had stepped out of a path and let a native by.

"Courtesy," said Warren. "That's the answer: courtesy and the laying on of hands."

He got up from the stool and walked out of the tent and met Falkner coming in.

"How is he?" Falkner asked.

Warren shook his head. "Just like the others. It was late in coming, but it's just as bad."

"Two of us," said Falkner. "Two of us left out of twenty-six."

"Not two," Warren told him. "Just one. Just you."

"But, sir, you're all—"

Warren shook his head.

"I have a headache," he said.

"I'm beginning to sweat a little. My legs are wobbly."

"Maybe—"

"I've seen it too many times," said Warren, "to kid myself about it."

He reached out a hand, grasped the canvas and steadied himself.

"I didn't have a chance," he said.

"I stepped out of no paths."

THE END

IN TIMES TO COME

The little surprise package this month surprises us, too. Last spring we conducted a test campaign to find the reaction of the readers to a 35c price—my apologies to you folks who got caught in the research. We couldn't warn you, or explain, because the 35c slug on the cover was the only change we could make in the magazine. The results of the test showed, however, that some ninety-eight per cent of the readers agreed with us that a change was necessary. Once there was a song about potatoes, et cetera, being cheaper; today steak is over one dollar a pound, and the paper they wrap it in has gone up, too. We are now paying our authors fifty per cent more than we were a year ago, and the paper we wrap their works in has gone up also. When we say this is your magazine, we aren't kidding; your money on the counter pays for it entirely. The authors, the paper, the editorial work—the entire job—is bought and paid for by you.

For many months I've been wanting some better paper for photographic features; many fine articles have been rejected because photographic illustration was essential—and impossible. Now we can do it. For the extra dime, you've bought increased word-age, higher rates for better authors, and a better grade of paper that permits photographic illustrations. The new section, you'll notice, is added, not substituted.

And—you'll find it In Times To Come!

THE EDITOR.

THE SOUL-EMPTY ONES

BY WALTER M. MILLER, JR.

A soul is a very precious thing indeed—if you're convinced you have none, and need one. And it's very difficult indeed to recognize what one is—if you believe you haven't any. And there are no meters or spectroscopes for that sort of thing . . .

Illustrated by Rogers

They heard the mournful bleat of his ramshorn in the night, warning them that he was friend, asking the sentries not to unleash the avalanches upon the mountain trail where he rode. They returned to their stools and huddled about the lamplight, waiting—two warriors and a woman. The woman was watching the window; and toward the valley, bright bonfires yellowed the darkness.

"He should never have gone," the girl said tonelessly.

The warriors, father and son, made no answer. They were valley men, from the sea, and guests in the house of Daner. The younger one looked at his sire and shook his head slowly. The father clenched his jaw stubbornly. "I could not let you go to blasphemy," he growled defensively. "The invaders are the sons of men. If Daner wishes to attack them, he is our host, and we cannot pre-

vent it. But we shall not violate that which is written of the invaders. They have come to save us."

"Even if they kill us, and take our meat?" muttered the blond youth. — "Even so. We are their servants, for the sons of men created our fathers out of the flesh of beasts, and gave them the appearance of men." The old one's eyes glowed with the passionate light of conviction.

The young one inclined his head gravely and submissively, for such was the way of the valley people toward their parents.

The girl spoke coldly. "At first, I thought you were cowardly, old man. Now I think your whole tribe is cowardly."

Without a change of expression, the gray-haired one lifted his arms into the lamplight. His battles were written upon them in a crisscross of white knife scars. He lowered



them silently without speaking.

"It's in the mind that you are cowardly," said the girl. "We of the Natani fight our enemies. If our enemies be gods, then we shall fight gods."

"Men are not gods," said the young one, whose name was Falon.

His father slapped him sharply across the back of the neck. "That is sacrilege," he warned. "When you speak of the invaders. They are men and gods."

The girl watched them with contempt. "Among the Natani, when a man loses his manhood by age, he goes into the forest with his war knife and does not return. And if he neglects to go willingly, his sons escort him and see that he uses the knife. When a man is so old that his mind is dull, it is better for him to die."

The old warrior glowered at his

hostess, but remained polite. "Your people have strange ways," he said acidly.

Suddenly a man came in out of the blackness and stood swaying in the doorway. He clutched his dog-skin jacket against his bleeding chest as a sponge. He was panting softly. The three occupants of the small stone hut came slowly to their feet, and the woman said one word:

"Daner!"

The man mopped his forehead and staggered a step forward. He kicked the door closed with his heel. His skin had gone bloodless gray, and his eyes wandered wildly about the room for a moment. Then he sagged to his knees. Falon came to his aid, but Daner shook him off.

"They're really the sons of men," he gasped.

"Did you doubt it?" asked the old valley man.

Daner nodded. His mouth leaked a trickle of red, and he spat irritably. "I saw their skyboats. I fought with a guard. They are the sons of men . . . but they . . . are no longer men." He sank to a sitting position and leaned back against the door, staring at the woman. "Ea-Daner," he breathed softly.

"Come care for your man, you wench!" growled the old one. "Can't you see he's dying?"

The girl stood back a few feet, watching her husband with sadness and longing, but not with pity. He was staring at her with deep black eyes, abnormally brightened by pain. His breath was a wet hiss. Both of them ignored their valley guests.

"Sing me 'The Song of the Empty of Soul,' Ea, my wife," he choked, then began struggling to his feet. Falon, who knew a little of the Natani ways, helped him pull erect.

Daner pawed at the door, opened it, and stood looking out into the night for a moment. A dark line of trees hovered to the west. Daner drew his war knife and stood listening to the yapping of the wild dogs in the forest. "Sing, woman."

She sang. In a low, rich voice, she began the chant of the Soul-Empty Ones. The chant was weary, slowly repeating its five monotonous notes, speaking of men who had gone away, and of their Soul-Empty servants they had left behind.

Daner stepped from the door sill, and became a wavering shadow, re-

ceding slowly toward the trees.

The song said that if a man be truly the son of men, the wild dogs would not devour him in the time of death. But if he be Empty of Soul, if he be only the mocking image of Man, then the wild dogs would feed—for his flesh was of the beast, and his ancestor's seed had been warped by Man to grow in human shape.

The two valley warriors stood clumsily; their ways were not of the Natani mountain folk. Their etiquette forbade them interfere in their host's action. Daner had disappeared into the shadows. Ea-Daner, his wife, sang softly into the night, but her face was rivered with moisture from her eyes, large dark eyes, full of anger and sadness.

The song choked off. From the distance came a savage man-snarl. It was answered by a yelp: then a chorus of wild-dog barks and growls raged in the forest, drowning the cries of the man. The girl stopped singing and closed the door. She returned to her stool and gazed out toward the bonfires. Her face was empty, and she was no longer crying.

Father and son exchanged glances. Nothing could be done. They sat together, across the room from the girl.

After a long time, the elder spoke. "Among our people, it is customary for a widow to return to her father's house. You have no father. Will you join my house as a daughter?"

She shook her head. "My people would call me an outcast. And your

people would remember that I am a Natani."

"What will you do?" asked Falon. "We have a custom," she replied vaguely.

Falon growled disgustedly. "I have fought your tribe. I have fought many tribes. They all have different ways, but are of the same flesh. Custom! Bah! One way is as good as another, and no-way-at-all is the best. I have given myself to the devil, because the devil is the only god in whom all the tribes believe. But he never answers my prayers, and I think I'll spit on his name."

He was rewarded by another slap from his father. "You are the devil's indeed!" raged the old man.

Falon accepted it calmly, and shrugged toward the girl. "What will you do, Ea-Daner?"

She gazed at him through dull grief. "I will follow the way. I will mourn for seven days. Then I will take a war knife and go to kill one of my husband's enemies. When it is done, I will follow his path to the forest. It is the way of the Natani widow."

Falon stared at her in unbelief. His shaggy blond eyebrows gloomed into a frown. "No!" he growled. "I am ashamed that the ways of my father's house have made me sit here like a woman while Daner went to fight against the sons of men! Daner said nothing. He respected our ways. He has opened his home to us. I shan't let his woman be ripped apart by the wild dogs!"

"Quieter!" shouted his father. "You

are a guest! If our hosts are barbarians, then you must tolerate them!"

The girl caught her breath angrily, then subsided. "Your father is right, Falon," she said coldly. "I don't admire the way you grovel before him, but he is right."

Falon squirmed and worked his jaw in anger. He was angry with both of them. His father had been a good man and a strong warrior; but Falon wondered if the way of obedience were any holier than the other ways. The Natani had no high regard for it. Ea-Daner had no father, because the old man had gone away with his war knife when he became a burden on the tribe. But Falon had always obeyed, not out of respect for the law, but out of admiration for the man. He sighed and shrugged.

"Very well, then, Ea-Daner, you shall observe your custom. And I will go with you to the places of the invader."

"You will not fight with the sons of men!" his father grumbled sullenly. "You will not speak of it again."

Falon's eyes flared heatedly. "You would let a woman go to be killed and perhaps devoured by the invaders?"

"She is a Natani. And it is the right of the sons of men to do as they will with her, or with us. I even dislike hiding from them. They created our fathers, and they made them so that their children would also be in the image of man—in spite of the glow-curse that lived in the ground and

made the sons of animals unlike their fathers."

"Nevertheless, I—"

"You will not speak of it again!"

Falon stared at the angry oldest, whose steely eyes barked commands, at him. Falon shivered. Respect for the aged was engrained in the fibers of his being. But Daner's death was fresh in his mind. And he was no longer in the valleys of his people, where the invaders had landed their skyboats. Was the way of the tribe more important than the life of the tribe? If one believed in the gods—then, yes.

Taking a deep breath, Falon stood up. He glanced down at the old man. The steel-blue eyes were biting into his face. Falon turned his back on them and walked slowly across the room. He sat beside the girl and faced his father calmly. It was open rebellion.

"I am no longer a man of the valley," he said quietly. "Nor am I to be a Natani," he added for the benefit of the girl. "I shall have no ways but the ways of embracing the friend and killing the enemy."

"Then it is my duty to kill my son," said the scarred warrior. He came to his feet and drew his war knife calmly.

Falon sat frozen in horror, remembering how the old man had wept when the invaders took Falon's mother to their food pens. The old one advanced, crouching slightly, waiting briefly for his son to draw. But Falon remained motionless.

"You may have an instant in which to draw," purred the oldest. "Then I shall kill you unarmed."

Falon did nothing. His father lunged with a snarl, and the knife's steel sang a hissing arc. Its point dug into the stool where the youth had been sitting. Falon stood crouched across the room, still weaponless. The girl watched with a slight frown.

"So, you choose to flee, but not fight," the father growled.

Falon said nothing. His chest rose and fell slowly, and his eyes flickered over the old one's tough and wiry body, watching for muscular hints of another lunge. But the warrior was crafty. He relaxed suddenly, and straightened. Reflexively, Falon mirrored the sudden unwinding of tension. The elder was upon him like a cat, twining his legs about Falon's, and encircling his throat with a brawny arm.

Falon caught the knife-thrust with his forearm, then managed to catch his father's wrist. Locked together, they crashed to the floor. Falon felt hot hate panting in his face. His only desire was to free himself and flee, even to the forest.

They struggled in silence. With a strength born of the faith that a man must be stronger than his sons, the elder pressed the knife deeper toward Falon's throat. With a weakness born of despair, Falon found himself unable to hold it away. Their embrace was slippery with wetness from the wound in his forearm. And the arm was failing.

"I . . . offer you . . . as a holy . . . sacrifice," panted the oldest, as the knife began scratching skin.

"Father . . . don't—" Then he saw Ea-Daner standing over the old man's shoulder. She was lifting a war club. He closed his eyes.

The sharp crack frightened and sickened him. The knife clattered away from his throat, and his father's body went limp.

Slowly, he extricated himself from the tangle, and surveyed the oldest's head. The scalp was split, and the gray hair sogging with slow blood.

"You killed him!" he accused.

The girl snorted. "He's not dead. I didn't hit him hard. Feel his skull. It's not broken. And he's breathing."

Falon satisfied himself that she spoke the truth. Then he climbed to his feet, grumbling unhappily. He looked down at the old man and deeply regretted his rebelliousness. The father's love of the law was greater than his love for a son. But there was no undoing it now. The elder was committed to kill him, even if he retracted. He turned to the girl.

"I must go before he comes to his senses," he murmured sadly. "You'll tend his head wound?"

She was thoughtful for a moment, then a speculative gleam came into her eyes. "I understood you meant to help me avenge my husband?"

Falon frowned. "I now regret it."

"Do the valley folk treat their own word with contempt?"

Falon shrugged guiltily. "I'm no longer of the valley. But I'll keep my

word, if you wish." He turned away and moved to the window to watch the bonfires. "I owe you a life," he murmured. "Perhaps Daner would have returned alive, if I had accompanied him. I turned against my father too late."

"No, Soul-Falon, I knew when Daner left that he meant to fight until he was no longer able—then drag himself back for the forests. If you had gone too, it would have been the same. I no longer weep, because I *knew*."

Falon was staring at her peculiarly. "You called me Soul-Falon," he said wonderingly; for it was a title given only to those who had won high respect, and it suggested the impossible—that the Soul-Empty One was really a man. Was she mocking him? "Why do you call me that?" he asked suspiciously.

The girl's slender body inclined in a slight bow. "You exchanged your honor for a new god. What greater things can a man offer than honor among his people?"

He frowned for a moment, then realized she meant it. Did the Natani hold anything above honor? "I have no new gods," he growled. "When I find the right god, I shall serve him. But until then, I serve myself—and those who please me."

The old man's breathing became a low moan. He was beginning to come awake. Falon moved toward the door.

"When he awakes, he may be so angry that he forgets he's your guest," warned the young warrior.

"You'd better come with me."

She hesitated. "The law of mourning states that a widow must remain—"

"Shall I call you Soul-Ea?"

She suffered an uncomfortable moment, then shrugged, and slipped a war knife in her belt thong. Her sandals padded softly after him as he moved out into the darkness and untethered the horses. The steeds' legs were still wrapped in heavy leather strips to protect them against the slashing fangs of the wild dogs.

"Leave Daner's horse for your father," said the girl with unsentimental practicality. "The mare's tired, and she'll be slow if he tries to follow us."

They swung into the small rawhide saddles and trotted across the clearing. Dim moonlight from a thin silver crescent illuminated their way. Two trails led from the hut that overlooked the cliff. Falon knew that one of them wound along the cliff-tops to a low place, then turned back beneath the cliff and found its way eventually to the valley. The other penetrated deeper into the mountains. He had given his word, and he let the girl choose the path.

She took the valley road. Falon sighed and spurred after her. It was sure death, to approach the invader's camp. They had the old god-weapons, which would greet all hostile attacks from the Soul-Empty Ones. And if the Empties came in peace, the sons of men would have another occupant for their stock pens. He

shivered slightly. According to the old writings, men had been kindly toward their artificial creatures. They created them so that the glow-curse that once lived in the earth would not cause their children to be born as freaks. And they had left Earth to the Empties, promising that they would come again, when the glow-curse passed away.

He remembered Daner's words. And Daner was right, for Falon had also caught glimpses of the invaders before he fled the valley. They were no longer men, although they looked as if they had once been human. They were covered with a thick coat of curly brown hair, but their bodies were spindly and weak, as if they had been a long time in a place where there was no need for walking. Their eyes were huge, with great black pupils; and they blinked irritably in the bright sunlight. Their mouths were small and delicate, but set with four sharp teeth in front, and the jaws were strong—for ripping dainty mouthfuls of flesh.

They had landed in the valley more than a month earlier—while a red star was the morning star. Perhaps it was an omen, he thought—and perhaps they had *been* to the red star, for the old writings said that they had gone to a star to await the curse's lifting. But in the valley, they were building a city. And Falon knew that more of them were yet to come—for the city was large, while the invaders were few.

"Do you think, Ea-Daner," he asked as they rode, "that the in-

vaders really own the world? That they have a right to the land—and to us?"

She considered it briefly then snorted over her shoulder. "They owned it once, Falon. My grandfather believed that they cursed it themselves with the glow-curse, and that it drove them away. How do they still own it? But that is not a worry for me. If they were gods of the gods, I should still seek the blood that will pay for Daner's."

He noticed that the grief in her voice had changed to a cool and deadly anger. And he wondered. Did the alchemy of Natani custom so quickly change grief into rage?

"How long were you Daner's woman?" he asked.

"Only a few months," she replied. "He stole me from my father in the spring."

Falon reflected briefly that the Natani marriage customs were different than those of the valley peoples, who formally purchased a wife from her parents. The Natani pretended to be more forceful, but the "wife stealing" could be anything from a simple elopement, agreeable even to the parents, to a real kidnapping, involving a reluctant bride. He decided not to press the question.

"Among my people," he said, "I would ask you to be my wife—so that you would not be disgraced by returning to your father's house." He hesitated, watching the girl's trim back swaying in the halflight of the

moon. "How would you answer me?"

She shook her head, making her dark hair dance. "Doesn't a valley widow mourn?"

"To mourn is to pity oneself. The dead feel nothing. The mourner does not pity the dead. He pities himself for having lost the living."

She glanced back at him over her shoulder. "You speak as if you believe these things. I thought you were renouncing your people?"

"There is some wisdom, and some foolishness in every people's way. But you haven't answered my question."

She shrugged. "We are not among your people, Falon." Then her voice softened, "I watched you fight the old one. You are quick and strong, and your mind is good. You would be a good man. Daner was a gloomy one. He treated me well, except when I tried to run away at first. But he never laughed. Do you ever laugh, Falon?"

Embarrassed, he said nothing.

"But this is pointless," she said, "for I am a daughter of my people."

"Do you still intend," he asked nervously, "to follow your husband to the wild dogs?"

She nodded silently, then after a thoughtful moment, asked, "Do you believe it's foolishness—to try to kill some of the invader?"

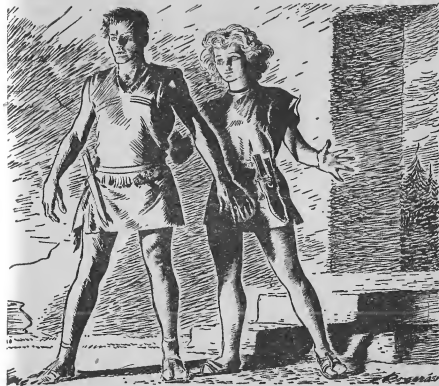
Falon weighed it carefully. His defiance of his own law might weaken her resolve, if he persisted in trying to convince her against the suicidal attempts. But he spoke sadly.



"We are the Soul-Empty Ones. There are many of us in the world. If one invader could be killed for every dozen they kill of us, we would win. No, Ea, I don't think it's foolishness to fight for lives. But I think it's foolishness to fight for tribes, or to give yourself to the wild dogs."

She reined her horse around a bend in the trail, then halted to stare out at the distant bonfires. "I'll tell you why we do that, Falon. There's a legend among my people that the wild dogs were once the pets of Man,

of Soul-Man, I mean. And it is said that the dogs scent the soul, and will not devour true Soul-Flesh. And the legend is also a prophecy. It says that some day, children will be born to the Natani who are Soul-Children—and that the wild dogs will again know their masters, and come to lick their hands. The Natani drag themselves to the forest when they die, in the hope that the dogs will not molest them. Then they will know that the prophecy has come, and the dead will go to the Place of Watching, as



the Soul-Men who made us did go."

She spurred her horse gently and moved on. But Falon was still staring at the bonfires. Why did the invader keep them burning nightly? Of what were they afraid in the darkness?

"I wonder if the dogs could scent the souls of the sons of men—of the invaders," he mused aloud.

"Certainly!" she said flatly.

Falon wondered about the source of her certainty—from legend or

from fact. But he felt that he had questioned her enough. They rode for several miles in silence, moving slowly along the down-going trail. The forests to their flanks were as usual, wailing with the cries of the dog packs.

Falon reined up suddenly. He hissed at Ea-Daner to halt, then rode up beside her. The dim shadow of her face questioned him.

"Listen! Up ahead!"

They paused in immobility, trying to sort out the sounds—the dog

packs, a night-bird's cry, the horses' wet breathing, and—

"Dogs," murmured Ea-Daner. "Feeding on a carcass in the pathway. Their growls—" Suddenly she stiffened and made a small sound of terror in her throat. "Do you suppose it could be—"

"No, no!" he assured her quickly. "A wounded man couldn't come this far on foot. And you heard—"

She was sobbing again. "Follow me," grunted Falon, and trotted on ahead. He found the sharp dog-spikes in his saddlebag and fitted them onto the toes of his sandals. They were six inches of gleaming steel, and sharpened to needlelike points. He called to the girl to do the same. The dogs usually weighed the odds carefully before they attacked a horseman. But if interrupted at mealtime, they were apt to be irritable. He unwound a short coil of rawhide to use as a whip.

He passed a turn in the trail. A dozen of the gaunt, white animals were snarling in a cluster about something that lay on the ground. Their dim writhing shadows made a ghostly spectacle as Falon spurred his mount to a gallop, and howled a shrill cry to startle them.

"Hi-yeet! Yee yeet!"

Massive canine heads lifted in the wind. Then the pack burst apart. These were not the dogs left by Man, but only their changed descendants. They scurried toward the shadows, then formed a loose ring that closed about the horsemen as they burst into the midst. A dog leaped for

Falon's thigh, then fell back yelping as the toe-spike stabbed his throat. The horse reared as another leaped at his neck, and the hoofs beat at the savage hound.

"Try to ride them down!" Falon shouted to the girl. "Ride in a tight circle!"

Ea-Daner began galloping her stallion at a ten-foot radius from the bleeding figure on the ground. She was shrieking unfeminine curses at the brutes as she lashed out with her whip and her spike. Falon reined to a halt within the circle and dismounted. He was inviting a torn throat if a dog dared to slip past Ea. But he knelt beside body, and started to lift it in his arms. Then he paused.

At first, he thought that the creature was an invader. It was scrawny and small-boned, but its body was not covered with the black fur. Neither was it a Soul-Empty One—for in designing the Empties, Man had seen no reason to give them separate toes. But Falon paused too long.

"Dog! Look out!" screamed the girl.

Falon reflexively hunched his chin against his chest and guarded his abdomen with his arms as he drew his war knife. A hurtling body knocked him off balance, and long fangs tore savagely at his face. He howled with fear and rage as he fell on his back. The dog was straddling him, and roaring fiercely as he mauled Falon's face and tried to get at his throat.

Falon locked his legs about the beast's belly, arched his body, and stretched away. The great forepaws tore at his chest as he rolled onto his side and began stabbing blindly at the massive head, aiming for a point just below the ear, and trying to avoid the snapping jaws. As the knife bit home, the fangs sank in his arm—then relaxed slightly. With his other hand, Falon forced the weakening jaws apart, pressed the knife deeper, and crunched it through thin bone to the base of the brain. The animal fell aside.

Panting, he climbed to his feet and seized the animal by the hind legs. The girl was still riding her shrieking circuit, too fast for the dogs to attack. Falon swung the dead carcass about him, then heaved it toward the pack. Two others leaped upon it. The rest paused in their snarling pursuit of the horse. They trotted toward their limp comrade. Falon mounted his stallion quickly.

"Draw up beside me here!" he shouted to the girl.

She obeyed, and they stood flank to flank with the man-thing on the ground between them. The pack swarmed about the dead one.

"Look, they're dragging it away!" said Ea.

"They see they can have a feast without a fight," Falon muttered.

A few seconds later, the pack had dragged the carcass back into the forest, leaving the horsemen in peace. Ea glanced down at the man-thing.

"What is it?" she asked.

"I don't know. But I think it's still

alive." Dismounting, he knelt again beside the frail body, and felt for a heartbeat. It was faintly perceptible, but blood leaked from a thousand gashes. A moan came from its throat. Falon saw that it was hopelessly mutilated.

"What are you?" he asked gently.

The man-thing's eyes were open. They wandered toward the crescent moon, then found Falon's hulking shadow.

"You . . . you look— Are you a man?" the thing murmured in a tongue that Falon had studied for tribal ritual.

"He speaks the ancient holy language," Falon gasped. Then he answered in kind. "Are you an invader?"

Dim comprehension came into the eyes. "You . . . are an . . . android."

Falon shook his head. "I am a Soul-Empty One."

The eyes wandered toward the moon again. "I . . . escaped them. I was looking for . . . your camps. The dogs—" His speech trailed off and the eyes grew dull.

Falon felt for the heartbeat, then shook his head. Gently, he lifted the body, and tied it securely behind his saddle. "Whoever he is, we'll bury him, after the sun rises." He noticed that Ea made no comment about the relative merits of tribal death-customs, despite the fact that she must feel repugnance toward burial.

Falon felt his face as they rode away. It dripped steadily from the numerous gashes, and his left cheek

felt like soggy lace.

"We'll stop at the creek just ahead," said the girl. "I'll clean you up."

The dog-sounds had faded behind them. They dismounted, and tied their horses in the brush. Falon stretched out on a flat rock while Ea removed her homespun blouse and soaked it in the creek. She cleaned his wounds carefully and tenderly, while he tried to recover his breath and fight off the nausea of shock.

"Rest a while," she murmured, "and sleep if you can. You've lost much blood. It's nearly dawn, and the dogs will soon go to their thickets."

Falon allowed himself the vanity of only one protest before he agreed to relax for a time. He felt something less than half alive. Ea stretched her blouse across a bush to dry, then came to sit beside him, with her back to the moon so that her face was in blackness.

"Keep your hands away from your wounds," she warned. "They'll bleed again."

He grinned weakly. "I'll have some nice scars," he said. "The valley women think a man is handsome if he has enough war-scars. I think my popularity will increase. Do you like warriors with mauled faces, Ea?"

"The white scars are becoming, but not the red, not the fresh ones," she replied calmly.

"Mine will be red and ugly," he sighed, "but the valley women like them."

The girl said nothing, but shifted

uneasily. He gazed at the moon's gleam on her soft shoulders.

"Will you still give yourself to the wild dogs if we return from the valley?"

She shivered and shook her head. "The Natani have scattered. A scattered people perhaps begins to lose its gods. And you've shown me a bad example, Soul-Falon. I have no longing for the dogs. But if the Natani found me alive—after Daner's death—they would kill me."

"Did you love him greatly?"

"I was beginning to love him—yes. He stole me without my consent, but he was kind—and a good warrior."

"Since you're breaking your custom, will you marry again?"

She was thoughtful for a moment. "Soul-Falon, if your cow died, would you cease to drink milk—because of bereavement?"

He chuckled. "I don't know. I don't have a cow. Do you compare Daner to a cow?"

"The Natani love animals," she said in a defensive tone.

"I am no longer a valley man and you are no longer a Natani. Do you still insist we go down against the invaders—alone?"

"Yes! Blood must buy blood, and Daner is dead."

"I was only thinking—perhaps it would be better to pause and plan. The most we can hope to do alone is ambush a guard or two before they kill us. It is foolish to talk of life when we approach death so blindly. I don't mind dying, if we can kill some invaders. But perhaps we can

live, if we stop to think."

"We have today to think," she murmured, glancing toward the eastern sky. "We'll have to wait for nightfall again—before we go out into the open places of the valley."

"I am wondering," Falon said sleepily, "about the man-thing we took from the dogs. He said he escaped. Did he escape from the sons of men? If so, they might send guards to search for him."

She glanced nervously toward the trail.

"No, Ea—they wouldn't come at night. Not those puny bodies. They have god-weapons, but darkness spoils their value. But when the sun rises, we must proceed with caution."

She nodded, then yawned. "Do you think it's safe to sleep a little now? The sky is getting lighter, and the dogs are silent."

He breathed wearily. "Sleep, Ea. We may not sleep again."

She stretched out on her side, with her back toward him. "Soul-Falon?"

"Hm-m-m?"

"What did the man-thing mean—'android'?"

"Who knows? Go to sleep—Soul-Ea."

"It is a foolish title—'Soul,'" she said drowsily.

A feverish sun burned Falon to dazed wakefulness. His face was stiff as stretched rawhide, and the pain clogged his senses. He sat up weakly, and glanced at Ea. She was still asleep, her dark head cushioned on

her arms; and her shapely back was glistening with moisture. Falon had hinted that he was interested in her—but only out of politeness—for it was valley etiquette to treat a new widow as if she were a maiden newly come of age, and to court her with cautious flirtation. And a valley man always hoped that if he died, his wife would remarry quickly—lest others say, "Who but the dead-one would want her?"

But as Falon glanced at the dozing Ea in the morning sunlight, her bronzed and healthy loveliness struck him. The dark hair spread breeze-tossed across the rock, and it gleamed in the sun. *She would make me a good wife indeed*, thought Falon. But then he thought of the Natani ways that were bred into her soul—the little ways that she would regard as proper, despite her larger rebellion—and he felt helpless. He knew almost nothing about Natani ritual for stealing brides. But it was certainly not simply a matter of tossing a girl over one's shoulder and riding away. And if he courted her by valley-custom, she might respond with disgust or mockery. He shrugged and decided that it was hopeless. They had small chance of surviving their fool's errand.

He thought of capture—and shuddered. Ea, being herded into the invaders' food pens—it was not a pleasant thought. There must be no capture.

A gust of wind brought a faint purring sound to his ears. He listened for a moment, stiffening anx-

iously. Then he stood up. It was one of the invaders' small sky carts. He had seen them hovering about the valley—with great rotary blades spinning above them. They could hang motionless in the air, or speed ahead like a frightened bird.

The brush obscured his view, and he could not see the sky cart, but it seemed to be coming closer. He hurried to untether the horses; then he led them under a scrubby tree and tied them to the trunk. Ea was rubbing her eyes and sitting up when he returned to the rock.

"Is my blouse dry, Soul-Falon?" He fetched it for her, then caught her arm and led her under the tree with the horses. She heard the purr of the sky cart, and her eyes swept the morning sky.

"Put your blouse on," he grumbled.

"Am I ugly, Soul-Falon?" she asked in a hurt tone, but obeyed him.

He faced her angrily. "Woman! You cause me to think of breaking my word. You cause me to think of forgetting the invader, and of stealing you away to the mountains. I wish that you were ugly indeed. But you trouble me with your carelessness."

"I am sorry," she said coldly, "but your dogskin jacket was no good for bathing wounds."

He noticed the dark stains on the blouse, and turned away in shame. He knew too little of Natani women, and he realized he was being foolish.

The sky cart was still out of sight, but the horses were becoming rest-

less at the sound. As Falon patted his stallion's flanks, he glanced at the body of the man-thing—still tied across the steed's back. His mouth tightened grimly. The creature had evidently been desperate to have braved the forest alone, unarmed, and afoot. Desperate or ignorant. Had he escaped from the invader, and was the sky cart perhaps searching for him? It was moving very slowly indeed—as he had seen them move when searching the hills for the villages of the Empties.

An idea struck him suddenly. He turned to the girl. "You know these paths. Is there a clearing near here—large enough for the sky cart to sit upon?"

Ea nodded. "A hundred paces from here, the creek bed widens, and floods have washed the bedrock clean. Duck beneath the brush and you can see it."

"Is it the *only* clearing?"

She nodded again. "Why do you ask? Are you afraid the cart will land in it?"

Falon said nothing, but hastily untied the body from his horse. He carried it quickly to the flat rock where they had slept, and he placed the man-thing gently upon it—where he would be in full-view from the sky. The sky cart crept into distant view as Falon hurried back into the brush. Ea was watching him with an anxious and bewildered stare.

"They'll see him!" she gasped.

"I hope they do! Hurry! Let's go to the clearing!"

He caught her arm, and they be-

gan racing along the shallow creek bed, their sandals splashing in the narrow trickle of shallow water. For a few seconds they ducked beneath overhanging brush, but soon the brush receded, and the bed broadened out into a flat expanse of dry rock, broken only by the wear-marks of high waters. Then they were in the open, running along the brush-line.

"In here!" he barked, and plunged over a root-tangled embankment and into a dense thicket. She followed, and they crouched quietly in the thick foliage, as the purr of the sky cart became a nearby drone.

"What are we going to do?" Ea asked tensely.

"Wait, and hope. Perhaps you'll get your knife wet."

Falon peered up through the leaves, and saw the sky cart briefly as it moved past. But the sound of its engine took on a new note, and soon he knew that it was hovering over the rock where the body lay. Ea made a small sound of fright in her throat.

After a moment, the sky cart moved over the clearing and hung growling fifty feet above them. As it began to settle, Falon saw a fur-coated face peering out from its cabin. He hissed at Ea to remain silent.

The sky cart dropped slowly into the clearing, rolled a short distance, and stopped, a pebble's toss from the hidden tribesmen. Its occupants remained inside for a moment, peer-

ing about the perimeter of brush. Then a hatch opened, and one of the feeble creatures climbed painfully out. There were three of them, and Falon shuddered as he saw the evil snouts of their flame throwers.

One of them remained to guard the ship, while the others began moving slowly up the creek bed, their weapons at the ready, and their eyes searching the brush with suspicion. They spoke in low voices, but Falon noticed that they did not use the ancient sacred tongue of Man. He frowned in puzzlement. The valley folk who had been close enough to hear their speech swore that they used the holy language.

"Now?" whispered the girl.

Falon shook his head. "Wait until they find the horses," he hissed in her ear.

The spider-legged creatures moved feebly, as if they were carrying heavy weights; and they were a long time covering the distance to the flat rock. The guard was sitting in the hatchway with his flame gun across his lap. His huge eyes blinked painfully in the harsh morning sunlight as he watched the thickets about the clearing. But he soon became incautious, and directed his stare in the direction his companions had gone.

Falon heard a whinny from the horses, then a shrill shout from the invaders. The guard stood up. Startled, he moved a few steps up the creek bed, absorbed in the shouts of his companions. Falon drew his war knife, and weighed the distance carefully. A miss would mean death. Ea



EA-DANER

saw what he meant to do, and she slipped her own knife to him.

Falon stood up, his shoulders bursting through the foliage. He aimed calmly, riveting his attention on an accurate throw, and ignoring the fact that the guard had seen him and was lifting his weapon to fire. The knife left Falon's hand as casually as if he had been tossing it at a bit of fur tacked to a door.

The flame gun belched, but the blast washed across the creek bed, and splashed upward to set the brush afire. The guard screamed and toppled. The intense reflected heat singed Falon's hair, and made his stiff face shriek with pain. He burst from the flaming brush, tugging the girl after him.

The guard was sitting on the rocks and bending over his abdomen. The gun had clattered to the ground. The creature had tugged the knife from his belly, and he clutched it foolishly as he shrieked gibberish at it. The others had heard him and were hurrying back from the horses.

Falon seized the gun and kicked the guard in the head. The creature crumpled with a crushed skull. *The gods die easily*, he thought, as he raced along the brushline, keeping out of view.

He fumbled with the gun, trying to discover its firing principle. He touched a stud, then howled as a jet of flame flared the brush on his left. He retreated from the flames, then aimed at the growth that overhung the narrowing creek toward the

horses. A stream of incendiary set an inferno among the branches, sealing off the invaders from their ship.

"Into the skycart!" he barked at Ea.

She sprinted toward it, then stopped at the hatch, peering inside. "How will you make the god-machine fly?" she asked.

He came to stare over her shoulder, then cursed softly. Evidently the skycart had no mind of its own, for the cabin was full of things to push and things to pull. The complexity bewildered him. He stood thoughtfully staring at them.

"They'll creep around the fire in a few moments," warned Ea.

Falon pushed her into the ship, then turned to shout toward the spreading blaze. "We have your skycart! If we destroy it, you will be left to the wild dogs!"

"The wild dogs won't attack the sons of men!" Ea hissed.

He glanced at her coolly. If she were right, they were lost. But no sound came from beyond the fire. But the invaders had had time to move around it through the brush, while the man and the girl presented perfect targets in the center of the clearing.

"Fire your god-weapons," Falon jeered. "And destroy your skycart." He spoke the ancient holy tongue, but now he wondered if the invaders could really understand it.

They seemed to be holding a conference somewhere in the brush. Suddenly Falon heard the horses neighing shrilly above the crackling

of the fire. There came a sound of trampling in the dry tangles, then a scream. A flame gun belched, and the horses shrieked briefly.

"One of them was trampled," Falon gasped. "Man's pets no longer know his odor."

He listened for more sounds from the horses, but none came. "They've killed our mounts," he growled, then shouted again.

"Don't the pets know their masters? Hurry back, you gods, or perhaps the skycart will also forget."

A shrill and frightened voice answered him. "You can't escape, android! You can't fly the 'copter."

"And neither can you, if we destroy it!"

There was a short silence, then: "What do you want, android?"

"You will come into the clearing unarmed."

The invader responded with a defiant curse. Falon turned the flame gun diagonally upward and fired a hissing streak to the leeward. It arced high, then spat into the brush two hundred paces from the clearing. Flames burst upward. He set seven similar fires at even intervals about them.

"Soon they will burn together in a ring," he shouted. "Then they will burn inward and drive you to us. You have four choices: Flee to the forest; or wait for the fire to drive you to us; or destroy your ship by killing us; or surrender now. If you surrender, we'll let you live. If you choose otherwise, you die."

"And you also, android!"

Falon said nothing. He stayed in the hatchway, keeping an eye on the brush for signs of movement. The fires were spreading rapidly. After a few minutes, the clearing would become a roasting oven.

"Don't fire, android!" called the invader at last.

"Then stand up! Hold your weapon above your head."

The creature appeared fifty paces up the slope and moved slowly toward them. Falon kept his flame gun ready.

"Where's the other?" he called.

"Your beasts crushed him with their hoofs."

Falon covered him silently until he tore his way into the clearing. "Take his weapon, Ea," he murmured. The girl obeyed, but her hand twitched longingly toward her knife as she approached. The creature's eyes widened and he backed away from her.

"Let him live, Ea!"

She snatched the invader's weapon, spat at him contemptuously, then marched back to the ship. Her face was white with hate, and she was trembling.

"Sit in the skycart," he told her, then barked at the captive. "You'll fly us away, before the fire sweeps in."

The prisoner obeyed silently. They climbed into the aircraft as the clearing became choked with smoke and hot ashes. The engine coughed to life, and the ship arose quickly from the clearing. The girl mur-

mured with frightened awe as the ground receded beneath them. Falon was uneasy, but he kept his eyes and his gun on the back of the pilot's furry neck. The creature chuckled with gloating triumph.

"Shoot the flame rifle, android," he hissed. "And we shall all burn together."

Falon frowned uncomfortably for a moment. "Quiet!" he barked. "Do you think we prefer your food pens to quick and easy death? If you do not obey, then we shall all die as you suggest."

The pilot glanced back mockingly, but said nothing.

"You tempt me to kill you," Falon hissed. "Why do you gloat?"

"The fires you set, android. The forests are dry. Many of your people will be driven down into the valleys. It is a strategy we intended to use—as soon as our city had grown enough to accommodate the large numbers of prisoners we will take. But you have made it necessary to destroy, rather than capture."

Ea glanced back at the fires. "He speaks truth," she whispered to Falon, who already felt a gnawing despair.

"Baa, hairy one! How will you kill thousands? There are only a few of you! Your god-weapons aren't omnipotent. Numbers will crush you."

The pilot laughed scornfully. "Will your tribesmen attack their gods? They are afraid, android. You two are only rebels. The tribes will flee, not fight. And even if some of

them fought, we have the advantage. We could retreat to our ships while enemies broke their knives on the hull."

The ship was rising high over the forest, higher than any mountain Falon had ever climbed. He stared out across the valley toward the seacoast where the fishing boats of his people lay idle by their docks. The owners were in captivity or in flight. The city of the invaders was taking form—a great rectangle, thousands of paces from end to end. A dozen metallic gleams were scattered about the area—the skyboats in which the invader had descended from the heavens.

He noticed the food pens. There were two of them—high stockades, overlooked by watchtowers with armed guards. He could see the enclosures' occupants as antlike figures in the distance. Neither pen seemed crowded. He frowned suddenly, wondering if the man-thing had been confined to one of the pens. The creature had been neither invader nor Empty. Falon felt a vague suspicion. He glanced at the pilot again.

"The dead one told us many things before he died," he said cautiously.

The creature stiffened, then shot him a suspicious glance. "The escaped android? What could he have told you?"

"Android?" Falon's hunch was coming clearer. "Do you call yourself an android?" he jeered.

"Of course not! I am a man!

'Android' is our word for 'Soul-Empty One.'"

"Then the dead one is not of your race, eh?"

"You have eyes, don't you?"

"But neither is he of our race!" Falon snapped. "For we have no toes. He is a soul-man!"

The pilot was trembling slightly. "If the dead one told you this, then we shall all die—lest you escape and speak of this to others!" He wrenched at the controls, and the ship darted valleyward—toward the city. "Fire, android! Fire, and destroy us! Or be taken to the food pens!"

"Kill him!" snarled Ea. "Perhaps we can fly the ship. Kill him with your knife, Soul-Falon!"

The pilot, hearing this, shut off the engines. The ship began hurtling earthward, and Falon clutched at his seat to keep balance.

"Fly to your city!" he shouted above the rush of air. "We will submit!"

Ea growled at him contemptuously, drew her knife, and lunged toward the pilot. Falon wrestled with her, trying to wrench the knife from her grasp. "I know what I'm doing," he hissed in her ear.

Still she fought, cursing him for a coward, and trying to get to the pilot. Falon howled as her teeth sank into his arm, then he clubbed his fist against her head. She moaned and sagged limply.

"Start the engine!" he shouted. "We'll submit."

"Give me your weapons then," growled the pilot.

Falon surrendered them quickly. The ship's engine coughed to life as they fell into the smoke of the forest fire. The flames were licking up at them as the rotors milled at the air and bore them up once more.

"Death is not to your liking, eh, android?" sneered the invader. "You'll find our food pens are very comfortable."

Falon said nothing for a time as he stared remorsefully at the unconscious girl. Then he spoke calmly to the pilot.

"Of course, there were others with us when we found the dead-one. They will spread the word that you are not the sons of men."

"You lie!" gasped the pilot.

"Very well," murmured Falon. "Wait and see for yourselves. The news will spread, and then our tribes will fight instead of flee."

The pilot considered this anxiously for a moment. Then he snorted. "I shall take you to Kepol. He will decide whether or not you speak the truth."

Falon smiled inwardly and glanced back at the fires beneath them. They were creeping faster now, and soon the blaze would be sweeping down the gentle slopes to drive the inhabitants of the forest into the valley. Thousands of Natani and valley warriors would swarm out onto the flatlands. Most would not attack, but only try to flee from

the creatures whom they thought were demigods.

Falon watched the invaders' installations as the ship drew nearer. Workmen were swarming busily about the growing city. First he noticed that the workmen were hairless. Then he saw that they were not Empties, but the scrawny soul-men. Furry figures stood guard over them as they worked. He saw that the soul-men were being used as slaves.

Soon they were hovering over the city, and glancing down, he noticed that the occupants of one pen were soul-men, while the other was for Empties. Evidently the soul-men were considered too valuable as workers to use as food. The two pens were at opposite ends of the city, as if the invaders didn't care to have the two groups contacting one another. Falon wondered if the *captive* Empties knew that their overlords weren't soul-men, as they had once believed.

The girl came half awake as they landed. She immediately tore into Falon with teeth and nails. Guards were congregating about the ship as the pilot climbed out. He held off the furious Ea while a dozen three-fingered hands tugged at them, and dragged them from the plane. The pilot spoke to the guards in a language Falon could not understand.

Suddenly the butt of a weapon crashed against his head, and he felt himself go weak. He was dimly aware of being tossed on a cart and rolled away. Then the sunlight faded

into gloom, and he knew he was inside a building. Bright self-lights exploded in his skull with each jog of the cart, and his senses were clogged with pain.

At last the jouncing ceased, and he lay quietly for a time, listening to the chatter of the invaders' voices. They spoke in the strange tongue, but one voice seemed to dominate the others.

A torrent of icy water brought him to full consciousness. He sat up on the cart and found himself in a small but resplendent throne room. A small wizened creature occupied a raised dais. Over his head hung a great golden globe with two smaller globes revolving slowly about it. The walls were giant landscape murals, depicting a gaunt red earth the likes of which Falon had never seen.

"On your feet before Lord Kepol, android!" growled a guard, prodding him with a small weapon.

Falon came weakly erect, but a sharp blow behind his knees sent him sprawling. The creature called Kepol cackled.

"This one is too muscular to eat," he said to the guards. "Place him in restraints so that he can have no exercise, and force-feed him. His liver will grow large and tender."

A guard bowed. "It shall be done, lordship. Do you wish to hear him speak?"

The king-creature croaked impatiently. "This pilot is a fool. If a few of the androids believe we are not men, what harm can be done? Most of them would not believe such ru-

mors. They have no concept of our world. But let him speak."

"Speak, android!" A booted foot pushed at Falon's ribs.

"I've got nothing to say."

The boot crashed against his mouth, and a brief flash of blackness struck him again. He spat a broken tooth.

"Speak!"

"Very well. What the pilot says is true. Others know that you are not men. They will come soon to kill all of you."

The boot drew back again angrily, but hesitated. For the king-creature was cackling with senile laughter. The guards joined in politely.

"When will they come, android?" jeered the king.

"The forest fires will cause them to come at once. They will sweep over your city and drive you into the sea."

"With knives - against machine guns and flame throwers?" The king glanced at a guard. "This one bores me. Flog him, then bring me the girl. That will be more amusing."

Falon felt loops of wire being slipped over his wrists. Then he was jerked erect, suspended from the ceiling so that his toes scarcely touched the floor.

"Shall we do nothing about the forest fires, your lordship?" a guard asked.

The king sighed. "Oh . . . I suppose it would be wise to send a platoon to meet the savages when they emerge. Our fattening pens need replenishing. And we can see if

there is any truth in what the captive says. I doubt that they suspect us, but if they do, there is small harm done."

Falon smiled to himself as the first lash cut across his back. He had accomplished the first step in his mission. A platoon was being sent.

The whip master was an expert. He began at the shoulders and worked stroke by stroke toward the waist, pausing occasionally to rub his fingers roughly over the wounds. Falon wailed and tried to faint, but the torture was calculated to leave him conscious. From his dais, the king-creature was chortling with dreamy sensuality as he watched.

"Take him to the man pen," ordered the king when they were finished. "And keep him away from other androids. He knows things that could prove troublesome."

As Falon was led away, he saw Ea just outside the throne room. She was bound and naked to the waist. Her eyes hated him silently. He shuddered and looked away. For she was the sacrifice which he had no right to make.

The man pen was nearly deserted, for the soul-men were busy with the building of the city. Falon was led across a sandy courtyard and into a small cell, where he was chained to a cot. A guard pressed a hypodermic into his arm.

"This will make you eat, android," he said with a leer, "and grow weak and fat."

Falon set his jaw and said nothing.

The guard went away, leaving him alone in his cell.

An old man came to stare through the bars. His eyes were wide with the dull glow of fatalistic acceptance. He was thin and brown, his hands gnarled by the wear of slave work. He saw Falon's toothless feet and frowned. "Android!" he murmured in soft puzzlement. "Why did they put you in here?"

Falon's throat worked with emotion. Here was a descendant of his creators. Man—who had gone away as a conqueror and returned as a slave. Nervously Falon met the calm blue-eyed gaze for a moment. But his childhood training was too strong. Here was Man! Quietly he slipped to his knees and bowed his head. The man breathed slow surprise.

"Why do you kneel, android? I am but a slave, such as yourself. We are brothers."

Falon shivered. "You are of the immortal ones!"

"Immortal?" The man shrugged. "We have forgotten our ancient legends." He chuckled. "Have your people kept them alive for us?"

Falon nodded humbly. "We have kept for you what we were told to keep, soul-man. We have waited many centuries."

The man stared toward one of the watchtowers. "If only we had trusted you! If only we had told you where the weapons were hidden. But some of the ancients said that if we gave you too much knowledge, you would destroy us when we tried

to return. Now you have nothing with which to defend yourselves against our new masters."

Falon lifted his head slightly. "Weapons, you say? God-weapons?"

"Yes, they're hidden in vaults beneath the ancient cities. We sent a man to tell you where to find them. But he probably failed in his mission. Do you know anything of him? Come, man! Get off your knees!"

Self-consciously, Falon sat on the edge of his cot. "We found this man dead in the trail—last night." He paused and lowered his eyes. It had been easy to lie to the invaders, but it would be harder lying to the gods. He steeled himself for a rebuke. "The emissary failed to tell us of the god-weapons, but he told us that the invaders were not men. The tribes now know this fact. In a few hours, they will attack. Will you help us, soul-man?"

The man gasped and wrinkled his face in unbelief. "Attack! With only knives and spears? Android, this is insanity!"

Falon nodded. "But notice how smoke is dimming the sun, soul-man. The forest fires are driving the people forth. They have no choice but to attack."

"It's suicide!"

Falon nodded. "But it is to save you that they do it. And to save the earth for both of us. Will you help?"

The man leaned thoughtfully against the bars. "Our people are slaves. They have learned to obey



their masters. It is hard to say, android. They would rally to a hopeful cause—but this seems a hopeless one."

"So it seems. I have planted a seed in the mind of the one known as Kepol. He also thinks it is hopeless, but when he sees a certain thing, the seed may bloom into panic. He underestimates us now. If later he comes to overestimate us, we may have a chance."

"What do you propose to do?"

Falon was loath to take the initiative and tell a soul-man what to do. It seemed somehow improper to him. "Tell me," he asked cautiously, "can you fly the skyboats in which the invaders brought you?"

The man chuckled grimly. "Why not? It was our civilization that built them. The invaders were but savages on Mars, before we came to teach them our ways. They learned from us, then enslaved us. Yes, we can fly the rockets. But why do you ask?"

"I am uncertain as yet. Tell me another thing. How did the one man escape?"

The man frowned, then shook his head. "This, I shall not tell you. We were months in preparing his escape. And the way is still open. Others might follow him. I cannot trust you yet, android."

Falon made no protest. "You've told me what I want to know—that others can escape. Can many go at once?"

The man was thoughtful for a moment. "It would take a little time—

to evacuate the entire man pen. But the others are already outside, working on the city."

"They will be brought back soon," Falon said dogmatically. "Wait and see."

The man smiled faintly. "You're sure of yourself, android. You tempt me to trust you."

"It would be best."

"Very well. The escape route is only a tunnel from beneath your cot to the center of the city." The man glanced around at the towers, then tossed Falon a key. "This will unlock your door. We filed it from a spoon. Let your unlocking of it be a signal. I'll speak to the others if they return, as you say."

Man and android eyed each other for a moment through the bars.

"Can you get word to the ones who are working on the city?" Falon asked.

The man nodded. "That is possible. What would you have them know?"

"Tell them to watch the forests. Tell them to set up a cry that the tribes are coming to save us."

"You think this will frighten our captors, android?"

"No, they will laugh. But when the time comes, the thought will be in their minds—and perhaps we can change it to fear."

The man nodded thoughtfully. "I suppose it can do no harm. We'll keep you informed about the fire's progress. If the wind doesn't change, it should burn quickly toward the valley."

The man departed, and Falon lay back upon the cot to think of Ea in the throne room. He had no doubt of her fate. When the king was finished with her, she would be assigned to the android pen for fattening. He had given her over into the sensual hands of the invader, and he resolved to atone for it by sheer recklessness when the time came for action. If the gods watched, then perhaps his own blood would pay for whatever she was suffering.

But another thought occupied his mind. The soul-man had called him "brother"—and the memory of the word lingered. It blended with the death-chant which Ea had sung for Daner when he went to die in the manner of his tribe—"The Song of the Soul-Empty Ones." "Brother," the man had said. Did one call an animal "brother"? Yet the man knew he was an android.

Several old men moved about in the stockade. Apparently their duties were to "keep house" for the younger laborers. Falon wondered about the women. None were visible. Perhaps they had been left upon the invaders' world. Or perhaps the invaders had other plans for women.

Soon he heard the sound of distant shouting from the direction of the city, but could make no sense of it. Apparently however, the workmen were setting up a cry that rescue was imminent. If only they would come to believe it themselves!

The hypodermic injection was taking effect. He felt a ravenous hunger that made his stomach tighten

into a knot of pain. A horrifying thought struck him suddenly, and he shouted to the men in the yard of the stockade. One of them approached him slowly.

"Tell me, soul-man," Falon breathed. "What sort of food do the invaders bring you? Is there any—meat?"

The man stiffened and turned away. "Once they brought us meat, android. Three men ate of it. We saw that the three met with . . . uh, fatal accidents. Since then, the Mars-Lords have brought us only fish and greens."

He moved away, his back rigid with insult. Falon tried to call an apology after him, but could find no words.

The sunlight was growing gloomy, with the smoke of the forest fires, but the wind had died. Falon prayed that it would not reverse itself and come out of the east.

He examined his chains and found the sleeve which fastened them to the cot was loose. The soul-men had evidently pried it slightly open. Then he found that the bolts which fastened the cot legs to the concrete floor had been worked free, then returned to their places. They could be extracted with a slight tug, the plate unscrewed, and the sleeve slipped off the leg. But he left them in place, lest a guard come. Beneath the cot was a dusty sheet of steel which evidently covered the tunnel's mouth.

When a guard brought food, Falon devoured it before the crea-

ture left his cell and begged for more.

"You will be fat indeed, android," chuckled the Martian.

Toward sunset, a clamor in the courtyard told him that the soul-men were being returned to the stockade. The light had grown forge-red, and the air was acrid with faint-smoke smell. The man, who was called Penult, came again to Falon's cell.

"The smoke obscures our vision, android," he said. "The Mars-Lords have sent a patrol to police the edge of the hills, but we can longer see them." He frowned. "The lords seem worried about something. They scuttle about chattering among themselves, and they listen secretly to their radios."

"Radios?"

"The voices with which they speak to the patrol. I think they are preparing to send others. Helicopters are taking off, but the smoke must choke their visibility. What can be happening?"

"The tribes are attacking, of course," lied Falon. He noticed that the wind had arisen again. It was sweeping the smoke along in the downdrafts from the foothills.

"What are your plans, android?" asked Penult. Several others had gathered behind him, but he hissed them away lest they attract the suspicion of the watchtowers.

"Wait until the invaders become desperate and send too many on their patrols. Then we shall rise up against the ones that remain."

"But we have no weapons."

"We have surprise. We have fear. We have your tunnel. And we must have lightning swiftness. If you can gain access to their skyboats, can you destroy them or fly them?"

Penult shook his head doubtfully. "We will discuss it among ourselves. I will see what the others wish to do." He moved away.

Dusk fell. Lights flickered on from the watchtowers, bathing the stockade in smoky brilliance. The courtyard was thronging with soul-men who wandered freely about their common barracks. Beyond the wall of the man pen, the evening was filled with angry and anxious sounds as the Mars-Lords readied more patrols for battle.

Falon knew that if they remained about the city, they would be safe. But the first patrol had undoubtedly been engulfed in the tide of wild dogs that swept from the forests. Their weapons would be ineffective in the blanket of smoke that settled about them. And the gaunt dog packs would be crazed by fear of the fire. Thousands of the brutes had rolled out across the plain, and the small patrol had been taken by surprise. The horsemen would come last. They would wait until the dogs had gone before they fled the fires. Perhaps they would arrive in time to see the dogs devouring the bodies of their gods. Perhaps then they would attack.

Penult stopped at Falon's cell. "We have managed to contact the android pen," he said. "In a few

moments they will start a riot within their stockade, to distract the watchtower guards. Be ready to unlock the door."

"Good, Soul-Penult! Pick up a dozen good men to rush the towers when we come from the tunnel. Let them go first, and I will be with them."

Penult shrugged. "It is as good a way to die as any."

Falon tugged the bolts from the floor, and slipped the chain's sleeve from the leg of his cot. The manacles were still fastened to his ankles and wrists, but he decided that they might make good weapons.

One of the searchlights winked away from the courtyard. Falon watched its hazy beam stab toward the opposite end of the city. Then he heard dim sounds of distant shouting. The riot had begun. Other lights followed the first, leaving the man pen illuminated only by the floods about the walls.

Quickly he slipped from his cot and moved to the door. A soul-man sidled in front of his cell to block the view from the towers while Falon twisted the key in the lock. Then he pushed the cot aside. A man came to help him move the steel plate. They pushed it away noiselessly, and the tunnel's mouth yawned beneath them. The cell was filling with men while the guard's eyes were distracted toward the android pen.

"We are all here, android," a voice whispered.

Falon glanced doubtfully toward

the courtyard. The men were thronging near the cell, kicking up dust to obscure the tower's vision. Evidently they had not seen; for Falon was certain that the invaders would not hesitate to blister the entire group with their flame throwers if they suspected escape. Already there were sounds of explosions from the other end of the city. Perhaps they were massacring the inhabitants of the other pen. He thought grimly of Ea.

A man had lowered himself into the tunnel. Falon followed him quickly, to be swallowed by damp and cramped blackness. They proceeded on their hands and knees.

Falon called back over his shoulder. "Tell the others to wait for us to emerge before they enter."

"They're setting the barracks and the stockade walls on fire, android," hissed the man behind him. "It will provide another distraction."

It was a long crawl from the stockade to the center of the city. He thought grimly of the possibility that the tunnel would be discovered by guards coming to quench the barracks fire. The small party might emerge into the very arms of the waiting Mars-Lords.

The tunnel was not made for comfort, and Falon's chains hindered his progress. He became entangled frequently, and bruised his kneecaps as he tripped over them. There was no room to turn around. If guards met them at the exit, there could be no retreat.

The lead-man stopped suddenly. "We're here!" he hissed. "Help aye hoist the slab of rock, android."

Falon lay upon his back and pressed his feet against the ceiling. It moved upward. A slit of dim light appeared. The soul-man peered outside, then fell back with a whimper of fright.

"A guard!" he gasped. "Not a dozen feet away! He's watching the man pen."

Falon cursed softly and lowered the lid of the exit. "Did he see the stone move?" he asked.

"No! But he seemed to hear it."

Suddenly there was a dull thumping sound from overhead. The guard was stomping on the stone slab, listening to its hollowness.

With an angry growl, Falon tensed his legs, then heaved. The stone opened upward, carrying the guard off balance. He fell with the slab across his leg, and his shriek was but another sound in the general melee as Falon burst upon him and kicked his weapon aside. The Martian, still shrieking, fumbled at something in his belt. Falon kicked him to death before he brought it into play.

The dozen soul-men climbed out into the gloom and raced for the black shadows of a half-completed masonry wall in the heart of the growing city. One of them seized the small weapon in the guard's belt, while Falon caught up the flame thrower.

The city was lighted only by the dim smoky aura of searchlights

aimed at the man pens. The riot had diminished in the android pen, but an occasional burst of sharp explosions belched toward it from one of the watchtowers. Falon's people were sacrificing themselves to draw attention away from the soul-men.

"Split in two groups!" Falon hissed. "Tackle the two nearest towers."

They separated and diverged, following the shadows of the walls. Leadership was impossible, for the operation was too hastily planned. Falon trusted in the hope that each man's mind had been long occupied with thoughts of escape, and that each knew the weakest spots in the invaders' defenses.

A few of the searchlights were stabbing out toward the west, where sounds of the dog packs were becoming faintly perceptible. Somewhere out upon the plains, the invaders' patrols were tiny island-fortresses in the infiltrating wave of dogs and horsemen. They could easily form into tight groups and defend themselves against the hordes with their explosives and flame-throwers, but they would be unable to stem the tide of flesh whose only real desire was to escape the fires. But some of the Natani might be attacking, when they saw that the dogs did not regard the Mars-Lords as their masters.

At the corner of the city, Falon's group found itself within stone's throw of a tower. They crouched in the darkness for a moment, watch-

ing the lights sweep westward. For now that the futile android riot was put down, the guards saw no threat save the unreal one on the plains. The threat's grimness was increased by the shroud of smoke that hid it and gave it mystery in the Martian eyes.

The man who had seized the belt weapon nudged Falon and whispered, "I'll stay here and cover your dash, android."

Falon nodded and glanced around quickly. They would be within the floodlights' glow, once they bounded across the wall — scurrying targets for all the towers. Suddenly he gasped. A man was running up the ladder of the tower to which the other group had gone. A searchlight caught him in its pencil. Then a blast of machine-gun fire plucked him off and sent him pitching earthward.

"Hurry!" Falon barked, and leaped across the wall.

They sprinted single file toward the base of the tower. A light winked down to splash them with brilliance. The man fired from the shadows behind them, and the light winked out. Dust sprayed up about Falon's feet as the guards shot from overhead. A streak of flame lanced downward, and two of the men screamed as it burst upward in a small inferno. The covering fire brought a guard hurtling from the tower. Falon leaped over his body and began scaling the steel ladder toward the cage.

A roar of voices came from the man pens. The barracks were blazing

while a handful of guards played hoses over the walls.

Falon climbed steadily, expecting at any moment to feel a searing burst of flame spray over him. But the guards above him were firing blindly toward the shadows whence came the covering fire. And the other towers were playing their lights about their own skirts, watching for similar attacks.

A slug ricocheted off the hatchway as he burst through it into the cage. Another tore through his thigh as he whipped the chain in a great arc, lashing it about the legs of one of the guards. He jerked the creature off his feet then dived at the other, who was trying to bring a machine gun into play. The android's attack swept him off balance, and Falon heaved him bodily from the tower.

Another man burst through the hatch and disposed of the guard who was being dragged about by Falon's chain.

Falon threw himself to the floor as a burst of bullets sprayed the open space above the waist-high steel walls of the cage. The nearest tower had opened fire upon them. Falon leaped for the permanently mounted flame thrower and sent a white-hot jet arcing toward the other cage. It fell short. He tried another burst, arcing it higher. It splashed home and the incendiary made a small furnace of the other tower, from which the guards hastily descended. The other towers were beyond flame-gun range, but they sprayed Falon's new-

ly won outpost with machine-gun fire.

"Lie flat!" shouted the man. "The armor will turn back the bullets."

Falon flung himself headlong while the rain of small-arms fire pelted the steel walls. He ripped a sleeve from his rawhide jacket and made a tourniquet for his flesh-wound. "Where are the other four?" he gasped.

"Dead," shouted his companion above the din.

A crashing roar came from the direction of the man pen. The barrage suddenly ceased. Falon chanced a glance over the low rim of the cage. One wall of the flaming stockade had collapsed, and men were pouring through the broken gap to overwhelm the firemen. The towers were turning their weapons upon the torrent of escapees. Falon's companion manned the machine gun and turned it on the invaders. "We'll draw their fire!" he called.

The second group had taken their objective, and another tower had fallen into the rebels' hands. Men poured through the stockade gap while the towers exchanged fire among themselves.

"They're trying to make it to the ships!" the gunner called. Then he fell back with half his face torn away.

Falon crawled to the gun and tried to operate it, but being unfamiliar with the god-weapons, he was only exposing himself to death. He dropped it in favor of the flame

thrower, lay beside the hatch, and shot down at the occasional unfortunate Martian that scurried within his range.

Several of the towers were silent now, including the other captive one. Falon slipped through the hatch and climbed down the steel ladder. His descent went unnoticed as the battle raged about the city and among the ships. He noticed that fire was spurring from several rockets, but they were still in the hands of the invader; for the man pen's escapees were still fighting for possession of the nearest ship.

Falon sprinted for the city's wall as a pair of wild dogs attacked him from the shadows. He fired them with a blast from the flame gun, then hurdled the wall and climbed atop a heap of masonry. Most of the lights were out now, and the darkness was illuminated only by the flaming stockade. The wild-dog packs were trotting in from the west, mingling in the battle to attack man, android, and Martian alike.

One of the ships blasted off into the night, but Falon felt certain that it was not commanded by men. It was the throne ship, in which the king resided. Another followed it; but the second seemed to be piloted by the escapees.

The battle had become chaos. Falon stumbled through the masonry, stepping over an occasional body, and looking for a fight. But most of the Martians had taken up positions about the ships. He no-

ticed that few of them were among the dead, who were mostly men and androids. But the rebels could afford to lose more than the Martians.

A few horsemen were joining the fray as the battle on the plains moved eastward. They rode into the tides of flesh that rolled about the ships. Falon saw a rider spit a Martian on his dog-spike and lift him to the saddle. The Martian shot him, then fell back to be trampled by the horse.

The two ships were returning. Falon flung himself down behind a wall as the throne ship shrieked past, splashing a wide swath of blinding brightness down the length of the city. The second ship, which had been in hot pursuit, nosed upward and spiraled off over the ocean to make a wide circle in the opposite direction. Falon, sensing a sky battle, ducked quickly out of the city's walls, caught the bridle of a runaway horse, and swung into the saddle.

The throne ship was coming back for another run, while the other was streaking back from the south. Falon realized vaguely what the man-pilot meant to do. He glanced toward the ground battle. It had subsided, and the warriors were scurrying for cover. Shrieks of "Collision!" and "Explosion!" arose from the mobs.

Hardly knowing what to expect, Falon decided quickly to follow their example. He reined the mare to a standstill, then swung out of the saddle and clung to her flank, hiding himself from the approaching ships. He saw them come together as he ducked his head behind the mare's neck.

The ground beneath him became bathed in pale violet. Then a dazzling and unearthly brilliance made him close his eyes. For several seconds there was no sound, save the snarl of the dog packs. Then the force of a thousand avalanches struck him. He fell beneath the mare, still



guarding his face behind her neck. The breath went out of him in a surge of blackness. He struggled for a moment, then lay quietly in ever-deepening night.

Daylight awakened him, gloomy gray dawnlight. The mare had tried to stagger to her feet, but had fallen again a few feet away. The valley was silent, save for the whisper of ocean breakers in the distance. He sat up weakly and knew that some of his ribs were broken. He looked around.

The plain was littered with bodies of dogs, men, and Martians. A spiral of smoke arose lazily from the wreckage. Then he saw figures moving about in the ruins. He managed a feeble shout, and two of them approached him. One was man, the other android. He knew neither of them, but the man seemed to recognize him as the prisoner who had occupied the cell in the man pen. Falon lowered his head and moaned with pain. The man knelt beside him.

"We've been looking for you, android," he murmured.

Falon glanced at the destruction again, and murmured guiltily. The man chuckled, and helped him to his feet. "We've got a chance now," he said. "We can go to the ancient

cities for the hidden weapons before the Martians can send a fleet. Mars won't even find out about it for a while. The ships were all damaged in that blast."

"Were many killed?"

"Half of us perhaps. You androids are lucky. Our ancestors gave you a resistance against radiation burns—so you wouldn't mutate from the residual radioactivity left by the last war."

Falon failed to understand. "Not so lucky," he muttered. "Our dead do not go to the Place of Watching."

The man eyed him peculiarly, then laughed gently. Falon flushed slightly; for the laughter had seemed to call him a child.

"Come, android," the man said. "People are waiting for you."

"Who?"

"A surly old codger who says he's your father, and a girl who says she's your woman."

Falon moved a few steps between them, then sagged heavily.

"He's unconscious," said the android, "or dead."

They lifted him gently in their arms. "Hell!" grunted the human. "Did you ever see a dead man grin?"

THE END

★ ★ ★ ★ ★

ASTOUNDING SCIENCE-FICTION



THE BODYGUARD BY VERNON W. GLASSER

He was a tough, hard man, a mercenary of the time. But he differed a little from the others — he wasn't convinced times should be like that!

Illustrated by van Dongen

I got into this because of that business with the Atom Master, who turned out to be nothing more than a crazy-old man living in the Ruins. He thought he was one of the Old Men, and called himself the Atom Master, and claimed he could blow everyone up. Of course, he could do no such thing. I went into the Ruins and brought him out, just a crazy sick old man. It got me some notoriety, because the other boys of the Bodyguard weren't too anxious to poke around in the Ruins and maybe catch a case of radiation.

I've been a Bodyguard for five years. Not that I like the work so much, but it's a good living. We're the only organized group this side of the mountains, almost two hun-

dred of us, and without us the Chief wouldn't last very long. That's why we're called the Bodyguard, and we are all guarding the same body, the Chief's.

So one day a couple of months after that Atom Master affair, I got a summons from the Chief himself. I'd met him personally only once before, when I was hired, though naturally I'd seen him often in parades, and once had been part of the horseback squad that pulled his car.

You don't waste any time when the Chief sends for you. I put on my best deerskin shirt with the fancy fringes, and went directly to the Fort. This is an old stone building, pretty well crumbled, and I believe the Old Men had used it for a military purpose. The Chief lives there with his wives, and also uses it as a headquarters. Although it is not in the best repair, it is strong enough to repel almost any kind of attack.

Some of the other Bodyguards were lounging around the outside stairs, and I said hello to them. Then I went in, and up another set of stone stairs, to the Official. The Official was supposed to have only one door, though I'd heard some of the boys hint that there was a secret exit from inside. A guard with a hatchet was standing before the door, and I recognized him. It was Billy Garth. I didn't like him much. "The Chief wants to see me," I said.

"Well if it isn't the Atom Mas-

ter," he said. "The tough boy. You got a mark?"

I showed him my summons, the usual hunk of clay stamped with a seal.

"Go ahead," he said, "and leave your gun behind. I'll hold it for you."

"Nothing doing," I told him. "My gun is one of the twelve or fifteen left in the whole Valley, and maybe in the world for all I know. If I ever let it out of my hands, I'd never get it back. We looked at each other for a minute, and I could see his hand getting tight on the hatchet. I said, "Don't be a fool, Billy. I may give you trouble."

"All right, tough guy," he said uglily. "Get going."

I opened the door, looking as casual as I could but being careful not to turn my back to Billy, and stepped into the Official.

The Chief is a man of about fifty, big, with gray hair and a very watchful look. He has a gun, too, of a different make than mine, and he lets the word get around that he possesses several boxes of bullets. He was wearing a real cloth shirt, and a cap with a shiny visor. Sitting on the arm of his chair was Norma, one of his wives, a short dark woman with a lot of jewelry. They both looked up when I came in.

"I know you," said the Chief. "Tom Hunter. I never forget a name."

"You wanted to see me, Chief?" I said.

"Sure," he said. "Norma, this is the boy who went into the Ruins after that crazy madman."

She smiled sulkily but said nothing, and I guess she wasn't supposed to answer, because the Chief went right on without waiting for her to say a word.

"I got a job for you, Tom," he said. "A big job that pays good—if you bring it off all right."

"I'm working for you," I said.

"Can you read, Tom?" he asked. "No."

"I can't either," he returned heartily. "That makes us both the same kind of man. I can't read, and I never saw the reason why I should, either."

I knew that was a lie. The Chief could read, all right, but he preferred to keep it quiet. As for myself, I have nothing against reading. My father could read, and offered to teach me when I was a boy, but I guess I was too busy learning the other things that a man needs if he is going to stay alive.

"Reading can be dangerous, Tom," the Chief went on, acting as if he were the best friend I had in the world. "A lot of trouble comes from reading. Here in Sacramento we've got a fine country, with a thriving town and satisfied farmers. Never any trouble, except from agitators. And when we catch an agitator, what do we find? Why, every time, he's some fool who's been secretly reading a book he dug up out of a hole. Ain't that right?"

"Sure," I said.

"How do you feel about these trouble-makers, Tom, and their holler about learning how to make machinery and stuff?"

"Look," I said, "I told you before, I'm working for you. You furnish my keep, and I've got no complaint with the quality of it. So I don't have to have any opinions. Tell me the job and I'll do it."

Norma smirked, and leaned down to whisper in the Chief's ear. He listened intently, his shrewd eyes never leaving me. "All right, Tom," he said at last. "I want you to find a man, and bring him back to me if possible. But I want him alive. He has to be alive. If he dies, you do too."

"Who is he?" I asked.

"His name is Johnson. He's another one of these agitators I've been telling you about. A slim red-headed guy with a squint."

That reminded me. I'd heard about Johnson. He was a farmer in the southwest border, not too far from the Ruins. He had been making a nuisance of himself by urging everyone to learn reading, and had also been trying to organize some of the other farmers against the Chief. Of course, that is rebellion, and cannot be overlooked; so I hadn't been too surprised to hear, one fine day, that Johnson disappeared. However, these things took place a good year ago, and I never suspected that the redhead might still be alive.

"I thought he was dead," I said.

"Did you?" said the Chief. "Must

be somebody else you're thinking about. This Johnson is alive, all right. I believe he went into the Ruins. He's working there, plotting against me, and that means against you, too. Now you know what you have to do."

If the Ruins do not frighten me as much as they do others, it's because I'm not superstitious. My father brought me up to believe only what I tested myself, and consequently I have no faith in mysterious radiations in the air, which can't be seen or felt, but nevertheless cause death. And if I keep quiet about that opinion, it's because I have learned that it does not pay to oppose the beliefs of other men unless there is a definite, practical reason for it. I felt no qualms, therefore, about going into the Ruins, but at the same time I knew that finding a man in that maze of broken buildings was not an easy task.

"How much time have I got?" I asked him.

"Whatever you need."

I figured I'd better get going right away. The Chief always tries to sound very generous about everything, but I knew he'd want results quickly. If I didn't produce, someone else would. He hadn't told me what the payoff would be, and I knew better than to ask him, but in a thing like this the reward if any is determined by the way you do your job.

When I left the room, Norma was whispering in the Chief's ear again, her eyes on me, and he was

listening carefully and nodding. Sooner or later I'd be able to guess what she was telling him.

I went to the stables and got my best horse, a gray, named Nick because one ear had been nicked by an arrow in a tax brush with the whisky distillers. The blacksmith was pounding at his anvil nearby, and stopped to wave at me.

"Got me a lot of new iron, Tom," he called.

"Where'd you get it?"

"Dug up some machinery near the Old Men's highway. Plenty knives and horseshoes soon."

I told him to save some for me, because I might be needing new equipment when I came back. I put a bedroll on Nick, and a good spear in the saddle socket. My gun was in the shoulder holster, and I had a very fine knife almost eighteen inches long in the blade. I don't carry a bow, because I'm a poor shot, and I prefer to stick to weapons I can handle better than other men, not worse. Then I started off at a canter to the southwest.

It was my intention to start my search at the old Johnson place, which I understood had been abandoned since shortly after the red-head disappeared. It seemed to me that he'd had a family, but I had no idea what may have happened to them. Because I had assumed his disappearance was due to the action of the Chief, it was natural to assume also that his family had been murdered. That's the way the Chief

works; he tries to take no chances.

Riding through the countryside, I noticed that the burned areas were getting harder to spot. Nature was coming back, like my father always said it would. Even when I was a boy the burned areas were already green during the rains, and now the shrubbery, and young trees, were beginning. The Wars of the Old Men took place when my grandfather was a boy and I am told that, at that time, the skies were dark with smoke for months in a row.

It is not possible to doubt that the Old Men had wonderful things. Their relics are everywhere, like the Chief's car which once supposedly could travel under its own power. Then, take the buildings; many are faced in part with stone which simply is unobtainable anywhere around here. It must have been transported from a quarry in the mountains, and the nearest source of good stone for building is at least a two-days' ride. My father, who was a very keen man and also, of course, had learned much from his father, said that the Old Men were highly skilled in the making of vehicles which propelled themselves. They also had flying machines, and a form of communication over great distances.

The agitators, as the Chief calls them, claim that we could have such things again if everyone learned to read the old books. That may be so. However, I don't feel that it's any of my business.

When my father died he gave me two good things. One was the gun, which he had received from his father, and which he told me would insure my independence so long as I used it only as a last resort, and carefully hoarded the thirty-three bullets remaining. I have used the gun four times in six years, and have twenty-nine bullets left. It marks me as a man apart, a man who carries potential death.

The other thing he gave me was advice. He said that I lived in a world of animals, and must govern myself accordingly. He said that animals could be either friends or enemies, and that even a friendly animal might turn on one suddenly. He said that I must try to make myself more than an animal, so that I would not be governed by passion alone. He said that a man could always control an animal, because a man thought and an animal only felt.

He gave me this advice because he was afraid for me, and wished no harm to come to me. I was a grown man when he died, but even to the end he would worry about any little scratch I received, or pat my shoulder as though I were still a little boy.

The old Johnson place is near the low range of hills which protects the Valley from the area of the Ruins, all around the Bay. It was late the next day that I got there, though I rode fairly steadily. A farmer in the vicinity pointed the



place out to me, keeping his distance pretty well when he noticed my Bodyguard badge.

I dismounted a good distance away and, taking advantage of whatever cover there was, circled the house cautiously. It wasn't deserted. There was smoke coming from the chimney, and a saddled horse was standing in the yard. I moved closer, got inside the rickety fence, edged over to the window, and looked in.

I knew what Norma had been whispering to the Chief. She'd told him to send someone else along, to check on me. Billy Garth, whom I'd last seen standing guard before the Chief's door, was inside now. Also, there was a red-haired girl about twenty years old, kind of skinny but still good-looking enough. Billy had

the girl tied up in a chair. The smoke was coming from the chimney because Billy was heating his knife, and I knew what he intended to do to the girl with it.

I figured I could take a chance on a bullet. Taking my gun out of the holster, I leaned it on the window sill. "Don't bother heating that any more," I said.

The girl jerked her head around and looked at me. She wasn't gagged, but she didn't say anything. There was a big red mark across her face, and I figured she'd been slapped around some.

Billy turned slowly to look at me, the red-hot knife in his hand. "Well, look who's here," he said. "The tough kid. Took your time getting here, didn't you."

"Put the knife away," I said.

"You might burn yourself." I watched him closely, because I don't trust Billy.

He just kept looking at me with his little red eyes. "You can't hit anything with that gun," he said.

"Sure not," I said. "Drop the knife, Billy."

He waited a little longer, and then sullenly dropped it point down into the floor, the wood smoldering at the contact. "You're safe," he snorted. "Got the nerve to come in now?"

I came in through the window, watching him. When I was inside, I put my gun back in the holster. "The Chief send you?" I asked.

"He thought maybe you needed some help."

"Why did you come here straight, instead of meeting me on the road?"

Billy picked up his knife and walked over to the corner where a bucket of water stood. He plunged the blade in the water several times, to cool it. "Never occurred to me," he said. "Were you lonesome?"

I wasn't going to get anything out of him. I turned my attention to the girl tied in the chair. "Who are you?" I asked.

She didn't say anything, just looked at me with eyes that almost scorched my jacket. However, the red hair made it obvious; she was one of Johnson's family, maybe his daughter. I took out my knife, went over, and cut the cords that tied her. It didn't change her expression; she just rubbed her wrists and

ankles, and let her eyes spit hate at me.

"You don't have to look at me like that," I said. "Seems to me you owe me a favor."

"I don't owe a Bodyguard anything," she whispered.

Billy laughed. His knife was cool, and he stuck it back in its scabbard. "You should ha' come a little later," he said. "She'd tell me where the old man is, all right, after she crawled around on her wrists and ankles for a while."

"You hear him," I said to the girl. "You want me to turn you over to him again, or will you tell us where Johnson is?"

She was scared. She seemed to draw up into herself. "I don't know," she said. "I don't know where he is."

"You're his daughter, aren't you?"

"Yes."

"What are you doing here?"

"I've been living in the woods," she explained rapidly. "Pa's been gone a year now, nobody knows where he is. I came back to look around kind of, and see if it was safe to live here again."

"Whereabouts in the woods you been living?"

"Just around."

"Your father's hiding out in the Ruins, isn't he?"

"I don't know what you're talking about," she said.

I turned to Billy. "How'd you find her?" I asked.

He grunted. "I came down here

to look the place over, same as you did. The old man is probably right around the neighborhood, living with one of these farmers. Anyhow, I see this girl sneakin' around in the house, so I grabbed her. Does that give you any ideas, bright boy?"

"You think Johnson's hiding out near here?" I asked him.

"Sure."

"Why?"

"A smart kid like you should be able to figure it out himself. Where else would he go?"

"For one thing," I said, watching the girl closely, "he might go into the Ruins. He believed in reading, so he'd go some place where there were a lot of books. He'd do that because he'd figure the books would show him how to get rid of the Chief."

It seemed to me the girl was trying too hard to look indifferent. I thought perhaps I was on the right track. We talked some more but got nowhere, except that I found out her name was Molly. She calmed down considerably after she was sure no one was going to burn her hands and feet off, but she stuck to her story about not knowing where Johnson was.

As it was getting late, I went out to get my horse, and stabled him in the old barn. I guess only Molly got much sleep that night, because both Billy and I were lying awake listening to each other's breathing. Maybe the Chief thought Norma'd

given him a good idea, sending Billy to watch me, but it didn't seem so smart to me.

In the morning I brought down a couple of rabbits with my slingshot, and we had a good breakfast. There is no shortage of game in the Sacramento Territory. In the hills of the east, where I was raised, a good man with a spear can bring down a buck almost for the asking.

Then I put Molly on my horse behind me, and we started out for the Ruins. Billy Garth was sulky, but he came along; I could see that he was afraid of radiations. I kept watching Molly for signs of the same fear, but, as she showed none, I concluded that she really had been living in the Ruins with her father, and living there had learned the radiations were only superstition.

When you get to the top of the hills just this side of the Bay, you can see the beginnings of the Ruins. It is a breathtaking sight; thousands and thousands of houses, all of them just shells. I could see that Billy was sweating, so I took a lot of pleasure in riding forward steadily.

From the crest of the ridge there is a steady slope down to the Bay. We could see the brightly shining waters, and across them the site of San Francisco, another of the cities of the Old Men. We could even see where the bridges had once jutted out from the shore. I said to the girl, "What was the name of this place, just below us?"

"I don't know," she said.

"Won't hurt you any to tell me,"

I answered. "I'd just like to know."

She paused. Though skinny, as I have said, she was somehow attractive. Her eyes were greenish and her skin was fair. "It was called Berkeley," she said. "That's what I was told. The Old Men had a lot of wonderful things here."

"For instance?"

"Books," she hesitated. "My father and I know said there were just thousands of books buried here."

"Can you read?" I asked her.

"Yes," she said challengingly. "I don't care who knows it, either."

"That's all right," I said. "It's no skin off my back if you can read. Whereabouts did you say these books were buried?"

She saw where I was leading, then, and with a furious look turned her face away.

I heard a loud laugh from Billy Garth, who had been riding a little behind. "She's smarter'n you," he jeered. "How about it, tough guy? Ain't you tired yet, or do I heat up my knife and do it my way?"

I didn't answer. Billy suddenly spurred his horse alongside and laid hold of the bridle. "O.K., Hunter," he said. "You're so smart. You figure on poking around in these Ruins forever, looking for an old fool who only has to duck behind a wall to hide?"

"Get your hand off," I said.

"I've gone as far into this death trap as I'm going!" he snarled. "We've got the answer right here in this girl. We don't have to look

for her old man. We just string her up by the thumbs in a nice prominent place, and let her holler a while, and *he'll* come to us. If you had half the nerve—"

I struck his hand off the bridle. He roared and lunged at me, clawing for his hatchet. I caught his wrist and twisted the hatchet out of his grasp. It fell on my horse; I could see the blood gush as the beast screamed and shot forward. All three of us, Molly, Billy and I, fell to the ground in a heap. Something hit my head and that was all I knew for some time.

I woke up not wanting to. From the way it hurt to breathe, I knew I must have a couple of cracked ribs. And when I raised my hand to my face, it came away sticky with blood. With a good deal of effort, I managed to sit up and prop myself against a tree bole. My head was buzzing, and it was a few minutes before my eyes could focus.

What puzzled me was, that I was still alive. When the fall knocked me out, Billy doubtless had given me a going-over, but why hadn't he killed me? He had taken my gun, but my knife was still in its sheath. I had to get up and move; I knew if I just lay there I would soon be too stiff and weak to help myself.

After a couple of failures, I got to my feet, and my head cleared. I examined the tracks on the ground, and got a better idea of what had happened. Billy had been scuffling with Molly, she had broken away, run, and he had followed her. He

had just been too busy to kill me, or perhaps had thought me already dead.

With my knife, I cut strips off my deerskin jacket, and bound my chest as well as I could. It helped some. Then, since my horse was gone, I started off on foot down the slope and into the Ruins, following the tracks.

By the position of the sun, I judged I had been unconscious for about two hours. Since Billy was mounted and I was not, I had no hope of overtaking him quickly, but I figured I would do it eventually.

The Ruins were beginning in earnest, now, and I lost Billy's tracks on the hard surface of an old road. It seemed to me that he would not go much farther down the slope, for fear of Radiations. I determined therefore to wait for developments, since Billy would have to make his presence known in some way if he intended to use Molly as bait for her father.

It was late afternoon by now. I ate some strips of the morning's rabbit, which I had shoved into a pocket. Then I climbed to the shattered roof of a small building nearby, and lay down behind the low parapet which surrounded the roof. From this position I had a fairly good view of the surrounding territory, merely by raising my head. It felt good to lie down and rest; my chest hurt with every breath, and my head throbbed.

With the coming of twilight, I

began to watch very carefully. At last I saw the first flicker of a fire about half a mile south. I got going the best I could, sliding off the roof and racing toward the south as fast as my painful chest would let me. I had to get there first.

The remains of a tower stood in a clearing. There were no building ruins within at least one hundred yards. Rubble from the tower itself made it very easy to climb to the highest point, about twenty feet above ground. Here, at the top, Billy Garth had built a huge fire. Sprawled at his feet, but plainly visible, was Molly. Her hands and feet were bound.

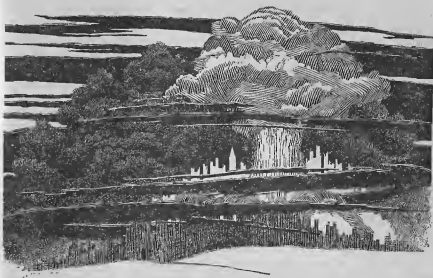
I found a good point of vantage, and settled down comfortably to wait. It wasn't long before I saw definite signs that someone was moving about in the perimeter of the Ruins. I advanced quickly, but at that I was almost too late.

"Hello!" came a voice out of the shadowy buildings. "What do you want, you up there with the fire?"

Billy Garth roared back, "I got something to trade!" He bent, seized Molly by the hair, and dragged her erect. "Look!" he boomed. "I got a red-headed girl named Molly. She's been beat up some. Maybe she'll get beat up some more!"

There was a pause, and then the newcomer's voice came again, hoarse and strained. "What do you want?"

"A trade!" shouted Billy gleefully. "One red-headed girl, in rea-



sonable good shape, breathing anyhow, to trade for a red-headed dog named Johnson!"

I had rounded the last building now, scrambling in my haste, and saw the stranger at last. It was Johnson all right; there was no doubt of it.

"Let the girl go," Johnson was saying. "Let me see her walk away, and I'll give up."

"You don't make no deals with me," said Billy. "I make the deals. See?" He swung his hand heavily against the girl, knocking her down. "You got nothing to make deals about, Johnson. The Chief wants you. If you give up now, or not, we'll get you. But if you don't show in a hurry, I start kicking your girl's ribs into a busted basket!"

"I'll come," sobbed Johnson.

I moved forward quickly. Before Johnson had a chance to step out of the shadows, I was on him. The weight of my body knocked him flat on his face, stunning him. I whipped a cord around his wrists. Then I lifted him to his feet, and he stood groggily, facing me. He was a tall man, thin, not so young any more, and he looked as though he hadn't eaten well for a while.

"Tricked!" he said thickly, as soon as he could talk. "You Bodyguards—"

"Keep quiet and you won't get hurt," I told him. I took out my knife and put it in his ribs. "Now move out into the light, and stop when I tell you to."

He walked, or rather staggered, a few steps into the flickering light thrown by the fire. I walked close

behind him, my knife point ready. I saw Billy Garth make a gesture of surprise when he recognized me, and draw my gun out of his belt.

The girl saw us too, and struggled to her knees. "Go back, Pa!" she wailed. "Run! Run!"

I halted Johnson, and called up to where the others were. "You're through, Billy," I said. "I've got Johnson. I'll kill him before I'll let you have him; and the Chief wants him alive. Throw down my gun, Billy."

He swore at me.

I said, "It's no use, Billy. You never shot a gun in your life. You can't possibly hit me. Throw down the gun."

"You haven't got the nerve to kill him," he said.

I grabbed Johnson by the hair and pulled his head back. I put my knife across his throat. "Throw down the gun," I said.

Billy hesitated and then, with a curse, hurled the gun to the foot of the broken tower. He scrambled down the slope of rubble and vanished into the dark at a dead run. A moment later I heard the hoofbeats of his horse.

Johnson was almost fainting. I got my gun, then climbed to the tower and cut the girl loose. She was in bad shape. I helped her down to the ground and she stumbled to her father, holding on to him and kissing him.

"You wouldn't have killed him, would you?" she said to me.

"I don't know," I answered.

"He's a Bodyguard," rasped Johnson. "What are you going to do with Molly? That other one offered to trade her for me."

"He was kidding," I said. "You didn't really believe him, did you?"

"No," he admitted reluctantly. "But I thought . . . if there was a chance—"

The girl wept. She looked homely with tears running down her face, and her eyes and cheeks puffy with bruises. "You should have stayed away, Pa," she said. "You never should have come."

Johnson turned to me again. "What are you going to do with us?" he said.

"I have orders," I told him. "I work for the Chief, and I carry out orders. He told me to bring you back to him alive, and that's just what I'm going to do. But he didn't say anything about the girl. As soon as I figure it's safe, she can go. I don't care where she goes, and I'll see that she has a chance to get clear."

They stared at me. "You mean that?" asked Johnson slowly.

"Of course I mean it," I said irritably.

They didn't say any more, but only clung to each other. Then Johnson showed us where we could find fresh water, and we made a camp. He led us to food, too, the canned food of the Old Men, which was plentiful in the Ruins. All together, he was as little troublesome a prisoner as I ever took.

"Aren't you afraid to eat this food?" he asked me, when I had opened several cans with my knife.

"Why?"

"Radiations."

I smiled. "I don't believe in radiations," I said.

He shook his head gravely. "They're real. Very terribly real."

"Then you shouldn't be alive," I pointed out. "You've been living here for a year."

"This area," said Johnson, "and most of the other outlying districts as well, were destroyed by ordinary bombs. If you can use a word like 'ordinary' for bombs that do so much mischief. So the radiations are not present everywhere. Over there"—he pointed out towards the Bay—"on the other side of the water, where the main city stood, the radiations are probably still present, though nowhere near as bad as they used to be. People no longer really understand what radiations are, what they do. So they keep away from all ruins, superstitiously. And that's a pity, because there is so much to be learned here."

"Books?" I said.

"Yes."

"What can you learn from them?"

"Everything. How to make buildings like these, how to live like the Old Men lived, do as they did—"

"Not interested," I said.

"Don't you want to have those things again?"

I got impatient. "I never had

them, so I don't miss them. My father said never to want anything I couldn't have. And now I'm going to get some sleep."

Molly came over. Without saying a word, she began to rebandage my chest. She did a good job, and I felt much better. Then, "What's your name?"

"Tom Hunter."

"All right, Tom. You're a hard man and a Bodyguard. But you helped me twice, even though you intend to turn my father over to the Chief. I won't ask you why you helped me, or why you have to take Pa to die."

"My father said—"

"I know. Your father said. Now your chest should feel better, if you give it some rest."

Though we all had apparently come to friendly terms, I did not neglect to tie up both of them securely for the night. I wanted to sleep without listening for hostile movements.

In the morning we started the long walk to Sacramento. I was stiff and sore, but the mild exercise and the warm sun combined to loosen my bruised muscles. We walked together, more like three friends than anything else, and Johnson talked very frankly to me.

He told me that he had known how to read since he was a boy. Living close to the Ruins, he had explored them for a long time, and had stumbled on a huge collection of books in a place near to the broken

tower where I captured him. The things he read in these books inflamed his desire to know more, to dispose of our corrupt Chief, and to set the community on a track which would bring it back some day to the achievements of the Old Men. There was actually, he said, a secret organization among the farmers of Sacramento Territory; the Chief knew it quite well, but dared not try to punish all involved because the disaffection was so widespread.

I, too, knew, of course, that the Chief was far from popular. That was why the Bodyguards existed. The news of a secret organization explained why the Chief was so concerned about Johnson, and why he wanted him alive.

Johnson said also that Molly had been working with him, to the extent of acting as liaison between the farmers and himself. She had been on one of her periodic trips into the Territory when Billy Garth found her.

"You shouldn't tell me this," I said.

"I think I should."

"Why?"

"Because you're on the wrong side in this struggle, Tom Hunter, and I believe you'll realize it soon."

I shrugged. "Your side may be wrong, too. You want to bring back the Old Men. You're like that crazy old man who called himself the Atom Master. What did the Old Men do that was so good? They built things and then smashed them. My grandfather was a little boy

then. The sky was black and fires shot out of the earth like fountains. They learned how to do that from the books. What good are the books if that was the final use for them?"

Johnson protested that I didn't understand. Maybe I don't. I never read the books, I don't know what they say. Maybe there are books that tell people how to be good to each other, too.

It was on the morning of our third day of travel that I saw the horsemen approaching over the meadows. From their formation and the way they rode, I knew them to be Bodyguards. I was worried for Molly. She should have left long ago, but insisted on coming along as far as possible. I looked for a place where she might hide, but it was too late. Farmhouses were visible but distant, and the fringe of trees that marked the Big River was half a mile away.

There were five horsemen, and they reined in before us. I recognized the leader, big Joe Wentworth.

"Don't reach for anything, Hunter," said Joe. "You're covered."

I hadn't made a motion. "Why should I reach?" I said. "What's up?"

"This Johnson?" asked Joe.

"Yes. What's the trouble?"

"I got my orders, Hunter. The Chief sent me to bring you in, and Johnson, too, if he was with you." He looked at me levelly for a moment. "I might as well tell you,

Tom. The Chief wants this guy Johnson alive, but he told me to finish you off if you make any trouble."

The picture was plain. Too plain. Billy Garth had returned, and told some interesting story.

"You won't have any trouble," I said. "What kind of a story did Billy tell?"

"Beats me. It's none of my business. Now, Tom, I'll have to ask you for your gun. We'll get it from you one way or the other, and it's better this way. You know me, and I promise I'll return it to you."

"I'll take your word for it, Joe," I said. Bitterly, I took the gun out of its holster and handed it to him. I gave him my knife, also.

He took both, and turned to Molly. "This girl," he said. "Who is she?"

"Never saw her before," I said. "She lives in that house over there, she says." I waved my hand toward a distant farmhouse. "We just came across her a few minutes ago."

Joe Wentworth looked at her. "She's got red hair," he said. "Like Johnson."

"Lots of people have red hair," I said.

"How about it, Johnson?" asked Joe. "You know this girl?"

"No," said Johnson.

"I think you guys are both liars," said Joe. "But the Chief didn't say anything about a girl. He said you and Johnson. And I got you and Johnson. That should be enough blood to drink for one day. All right, let's get going!"

Johnson and I were swung up, each behind one of the riders, and we galloped off. I turned my head and saw Molly stand watching us for a moment, then turn and run in the direction of the farmhouse.

Walking had been easier on my ribs than riding. By the time we got to the Fort, I was badly shaken up. I expected to be taken in to the Chief, but instead I was thrown into one of the strongrooms of the cellar, with Johnson. I made no fuss about it; there's no use complaining about something you can't help.

I sat there for two days with Johnson. He tried to thank me for not giving Molly away, but I cut him off short. I wasn't too sure why I'd done it. And I suspected that, by that impulse, I might have put a noose around my neck. "That's your trouble," I told myself. "You're too squeamish. You should have killed Billy Garth when you first put a gun on him through the window of the old Johnson place."

Finally they came for us and marched us upstairs, into the Official. I got the feeling that something was wrong. The men who brought us looked as though they had been fighting recently. One had a bandaged arm. They were surly and silent, not what I would have expected. I asked them what the trouble was, but they said nothing. They brought us into the Official and stood by the door, inside.

The Chief sat behind his desk, looking sour. Norma was on the

arm of his chair, as though she hadn't even moved since last I saw her. Joe Wentworth leaned against the wall, his face dark, and I wasn't at all surprised to see Billy Garth, who stood near the Chief with one hand on the hatchet in his belt. He was grinning slyly.

The Chief examined us critically, while Norma whispered in his ear like a black bird perched on his shoulder. "So you two men been working together," he said at last. "No wonder you didn't mind going into the Ruins after the Atom Master, Hunter. You had friends there, eh?"

I didn't answer.

"Then when I sent you for Johnson, that was right up your tree. Only you didn't intend to get him. You just figured on warning him."

"Ask Joe Wentworth," I said. "Ask him where I was going when he arrested me."

"Yeah, yeah," said the Chief. "You might have been going anywhere. Besides, I think maybe Joe is a liar, too." He darted an angry glance at Wentworth, who looked blacker than ever. "Because you had a girl with you, and Joe let her go. Didn't you, Joe?"

"You didn't say nothing about a girl," responded Joe sturdily.

The Chief leaned back and was whispered to some more. Then, "That was Johnson's daughter. You didn't know that, did you? The hell you didn't. You let her get away to stir up these fool farmers."

I said, "He didn't know it was

Johnson's daughter. I knew, but I told him it wasn't."

I was standing before his desk. The Chief is a big man, but he moved faster than I have ever seen anyone move. In a single motion he rose from his chair, plucked his gun from his belt, and hit me across the face with the barrel. I didn't even have time to duck. I landed on the floor, blood streaming from a face still puffy since my encounter with Billy Garth near the Ruins. Even with the pain, I couldn't help noticing Norma's malicious smile.

I climbed to my feet and let the blood drip. "You shouldn't have done that," I said. "Now, watch out for me."

"You!" said the Chief. "Watch out for you! You renegade!" He was white with rage. "You let the girl go, and now every blasted farmer in the Valley has ridden into town yelling for Johnson!"

Norma grabbed his arm, as though to stop him from saying too much. He shook her off. "Thirty Bodyguards dead!" he bellowed. "I shouldn't ha' done that to you, hey? Spying for this red-headed bookworm, and you tell me to watch out for you!"

Johnson spoke up. "This man found me for you, but he found me too late. Whether or not you kill me now doesn't matter. The date for this action was set a month ago. You're through, Chief."

The Chief sat down and looked at him coldly. Norma perched on the arm of the chair again, and put

her hand on his shoulder. She bent and whispered to him.

"Since you think you know so much about it," said the Chief, "I'll tell you something you don't know. We're going to wipe out your whole lousy crew. I'm going to fix you up right now, both of you, just as pretty as I can make you. Then I'll hang what's left of you outside the window, for your friends to see."

It got very quiet in there. I began to understand what was happening. Some kind of revolt had started, all right, and the Chief was hard-pressed. He might yet even be beaten. I felt a little hope. There could be a way out. I looked around the room, at the Chief, at Billy, at Joe Wentworth, at the two guards standing by the door. Joe had my

gun in his belt, and only the Chief had another.

"Well, Joe," I said, "seems to me you got something you promised to return to me."

The Chief leaned forward. "We'll start now," he said. I felt my elbows clamped from behind by one of the guards. Johnson was held the same way.

"All right, Billy," said the Chief. "You can start in on your friend Hunter. Joe, I want you to mussy up Johnson."

I heard noises outside, and shouting. I figured that if I could stay alive for a few minutes more, I might have a chance. Billy approached me, grinning all over. He was going to like this. I kicked back hard and twisted forward at the same time, feeling my broken ribs



stab me like knives. I got one arm loose just in time to deflect Billy's first punch, which glanced off the side of my head but hurt me anyhow. I got my other arm loose and shook off the guard just in time to receive another blow full in the face. It knocked me sprawling into the corner.

I saw Billy coming at me, and tried to get up in time to avoid his feet, I wasn't sure I'd manage. Then something flew through the air and landed against my chest with a thump. It was my gun!

"I near forgot to return it," said Joe calmly.

With a cry of fear, Billy Garth snatched at his hatchet. He didn't draw it. I shot him through the head, and he fell in a heap before me.

Too much happened, too fast. The Chief missed with his first shot, and never had a chance to try again. Joe Wentworth and I, together, beat him to death. I put a bullet through Norma myself, while she ran screaming for the door. I forgot about the two guards until I noticed that Johnson was holding them off, very nicely, with the Chief's own gun. Then, when it was over, when my head cleared and I could see the blood and bodies, I was sick, while big Joe Wentworth watched me solemnly.

So that was the end of the big revolt. There was no more fighting after Joe and I dragged the bodies downstairs, out in the front of the Fort, and nailed them to the door.

That was Johnson's idea; he said it would give notice, and it did.

The Chief was dead, and so the Bodyguards had no leader; but Johnson was alive, and he had all the farmers Molly had gathered. The result was easy to see.

It was two weeks later that I stood in the Official again. The blood had been washed off the floor, but it seemed to me that I could still smell it. The room was different in another way, too, because now Johnson sat in the big chair, and Molly stood beside him.

"I wish you'd change your mind, Tom," said Johnson.

"I'm going," I said.

"We could use you."

"You've got Joe Wentworth," I said. "He's better than I am. You've got a gun now, too." I pointed at the Chief's gun, which he was wearing.

"But you could help, Tom," said Johnson. "We can get a new world started here. We're not the only people left alive in this continent. There must be other groups, many groups, across the mountains to the east. We can join them all together, get a Nation like the Old Men had."

"Let him alone, Pa," said Molly. She came over and put her hands on my shoulders. Her face wasn't bruised any more, and she was very good-looking, though she was skinny as ever. "Your chest feel all right now, Tom?"

"Sure," I said. "I can travel fine."

"What's the trouble, Tom?" said Johnson. "You know how much we'd like your help in this. We've got a lot to do. Set up schools, set up proper authority, see that sound laws are made, explore the Ruins—"

"Look," I said, "I quit being a Bodyguard when the Chief swiped me across the face with a gun barrel. By any other name, it's still Bodyguarding you want me for. I've got nothing against you, Johnson. You won't order any killings just for the fun of it. But I don't go for your ideas."

"What ideas?"

"You think we had trouble because we had bad government. You think good government will make people better. I don't see it that way. The trouble is not bad government, but just government itself. With the wrong kind of people, no government can do any good. With the right kind of people, you don't need government at all."

"You think you can get the right kind of people by starting from the government end, and telling them to go to school, and putting out Bodyguards to walk the fields and keep people straight. I think you've got to start from the other end, forget the Old Men and the way they

worked things, forget about organizations and just start raising people right. Like my father wanted to raise me, to be a man and not an animal."

"Johnson, you want to bring back the days of the Old Men, but I'm glad the Old Men are gone, and I hope they never come back. I had enough killing right here, in this room. I'm not interested in any more, for any purpose."

I ripped my gun out of its holster and threw it on the table before Johnson. "Here," I said, "keep this one until the books teach you to make some more."

"I'm sorry," said Johnson. "I'm really sorry."

I turned around and went out, down the stairs and into the sunshine. The air smelled good. I saw that Molly had followed me.

"That's the longest speech I ever heard you make," she said.

"The last, too."

"Where are you going now?"

"East. To the mountains. Where I used to live with my father."

"You got a wife there, maybe?"

"No. You got somebody?"

"No."

We looked at each other, and then we both began to laugh.

THE END

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PROMETHEUS

BY JULIAN CHAIN

Illustrated by Orban

There is a further mystery associated with this planet. Stories are told of a voyage to a sister planet next nearer their sun. The fact of such a voyage was confirmed by exploration of the latter, which was found to possess an identical and obviously imported flora. It is in all ways a fertile, beautiful, and completely unattended world. Why the dominant species of the third planet failed to exploit its ini-

tial success it is impossible to imagine. As for the ship in which the flight was made; no record survives. Presumably it was powered by some adaptation of the hydrogen fusion reactor which now represents the main source of energy for the species and is the sole relic of a vanished or aborted atomic era.

*Kran Author: A History of
Irvidelian Spatial Expansion*

ASTOUNDING SCIENCE-FICTION

Men sought for a "Place in the Sun"—then the Trees gave them homes, and finally an even cozier achievement; a little Sun in the Place . . . and no place among the Stars.

*"O sole o mio
Sun in all his splendor!"*

Each note of the song was a differently-colored jewel; high, sweet, strong and pure. Madeleine sang in the open glade to the imagined thousands who would once have gathered to hear such a voice as hers. Once, before those thousands fled their deserted cities to live in a vast suburb of hollow trees. The voice that missed its audience by a few generations soared on:

*"Forgotten is the storm
The clouds now vanish"*

Her only listener lay in a trance of recollection. Daniel Clark was engaged in playing his usual role of audience for his wife, trying to make up in appreciation what he lacked in number. Ordinarily at such times his thoughts wandered without object but the words of the song struck a responsive chord and his mind focused; the storm was forgotten perhaps, but the clouds lay dark over the planet. A new age had come, engulfing and choking the old in the moment of its most vigorous growth.

Everyone was in it; the unready, the unwilling, the puzzled and the despairing; and the sad tatters of maladjustment ensnared all efforts at transition. It was the Trees that did it. The Trees were themselves only an incidental offshoot of the discovery of plant hormones but they had remorselessly led social evolution into a blind alley with their single enticement of gracious and inexpensive shelter. For as soon as Peter Wark broadcast his techniques for the development and biocatalytic sculpture of the growing tree into a functional home, the great dispersion began. Man was a tree-dweller now as he had been long ago and his cave in the cliff, natural or fabricated, was abandoned. The Trees had taken root in his culture as they did in the soil itself and destroyed that culture much as an efficient invader upsets an established ecology. Or perhaps the fault lay with the old industrial society, various and brilliant as it had been, that needed only this one agent to precipitate into another pattern in which all things were sacrificed for stability. For stability of a sort had certainly been achieved. The Trees were as stable as—trees. Not only had they sucked into their

PROMETHEUS

roots the energies of the fading industrialism but they had successfully resisted destruction even by the fires of war. It was that that finally sealed the consciousness of their inevitability into the minds of men.

Of all nations, Russia, intoxicated by its new industrialism and able by fiat to control the movement of her population, had longest resisted the new influence. Her neighbors compared with terror her growing might with their own diminishing potentialities and estimated themselves already lost in the next conflict. For a long time catastrophe impended as Russia watched the ratio of power scale in her favor beyond possible doubt. In a last desperate maneuver the United States donated a small stock of hydrogen bombs to every nation on earth to make the price of conquest high. In an ironic effort to preserve the semblance of neutrality, Russia was included in the bequest.

The inevitable was not forestalled. The necessary pretext arose or was manufactured and Russia fell upon little Yugoslavia, shrieking threats of total annihilation in the event of atomic reprisal against herself. The industrial potential of the defender was nil, for Yugoslavia, a country of small landholders, had resisted alterations in economic structure during its period of native communism to slip easily into the new rural order. This nation of tree-dwellers now bore the onslaught of a war in which every modern implement was employed.

Whereupon it became abundantly clear that the power of the new order to endure exceeded that of the old to destroy. The already dying cities of Yugoslavia were easily occupied but the land defied conquest. A man's home became his castle in a new sense and the mechanized offensives ground to a crawl against millions of wooden pillboxes defended with small arms by nearly self-sufficient family groups. Then, when the fears of the defenders gave way to contempt, the American atomic donation was flown off hidden airstrips. After the ensuing holocaust in which Russia's industrial potential and governing elite disintegrated together with her cities and a large part of her population, the Russians also retreated into the woods.

So the Trees stabilized everything, even peace. Manners and morals, too, became more strict and less exciting in Suburbia. At the birth of a female child it became customary to develop a Tree which should be ready to house her family when she came of age. Matings were usually arranged in the neighborhood since travel was restricted and people lived and died in the area of their birth except for the few who were able to attend the small school towns for their educations. The world was semiparalyzed by energy-lack. The great cities had been many things: Workshops, transport-centers and markets; but primarily they had been power generators, where great concentrations of men wrestled the stored resources of earth into avail-

ble energy. Now the employees played truant in the woods and the furnaces were cold. Some industry still survived in the dying cities but the energy available in Suburbia was only that which could be generated locally with primitive materials and this was at a level which threatened society with decline from the rural to the primitive.

That threat is gone now, Daniel thought. I've given them the power they need in little, eternal packages. They can live in the woods forever. I am the Prometheus of this culture I hate.

*"The fresh'ning breezes
Heavy airs will banish"*

Daniel's thoughts swung back to the singer. It was strange, the way his life and Madeleine's were tied together. Even in childhood she was always there. She was born practically in the next Tree. They played together, fought together, and as they grew older they were always invited together. For from early adolescence it was apparent to everyone that they would one day marry and live in her Tree together. Apparent, that is, to everyone but Daniel. From his point of view Madeleine left much to be desired. She was sulky, changeable and intense, and was seldom simply good fun or comfortable to be with. The truth was that she was dominated by her voice. Madeleine's voice! In an age departed that voice would have enabled her to sup with queens

and walk amid worshippers. But now that luminous talent was exhibited to yokels whose musical tastes were confined to trite country melodies. Yet she would embarrass him by singing on all occasions to friends who considered her performance simply silly. Moreover, afterwards he was made to feel the sting of her rebuffed pride. Still, she was different, and after a time away from her Daniel would miss her and find her differentness refreshing.

He remembered their last date before she left. It was a summer night dance and his mother had been at him:

"Why don't you ask Maddy, Dan?"

"Aw, you know how she acts."

"Think how hurt she'll be if you don't."

In the end, of course, he had asked her. Madeleine had naturally expected him to do so and had made her preparations.

"But look, Maddy, this time let's just have fun."

"You mean you don't want me to sing!"

"You know very well that nobody likes it. They just think it's queer."

"They can think what they like! I'll sing if I please! If you care so much what they think, you needn't take me!"

"All right. We'll just have another rotten night!"

It was worse than Daniel could have imagined. The usual provocation arose of course: "Aren't you going to sing tonight, Maddy?"

This, from a small malicious female creature who usually referred to her victim as Mad Madeleine. And the answer: "Yes, if you like."

Somewhere Madeleine had come across the aria "One Fine Day" from "Madam Butterfly" which, certainly, none of her callow audience had ever heard. She rendered all of it now, in French. The joke was just too good; the listening group whooped with the last soaring note and laughed itself to tears. Madeleine was white. Strangely too, Daniel, instead of his usual stricken embarrassment felt a sense of adult outrage. He had just "caught on." With the first pure notes there had come to him a feeling that was afterwards to be forever renewed when he heard Madeleine singing — that each note was a ray of pure and different color. The phrase "coloratura soprano" would have made sense to him then, if he had ever heard it.

He rose to his feet and shouted: "Do any of you know French?" Then, into the amazed silence: "You don't even know what you're laughing at!" And to Madeleine: "Let's get out of here."

He remembered later, how Madeleine, soft and trusting for being defended, cried and cried as he held her. And her words: "I can't stand it here, Dan. I just can't stand it any more."

A week later she was gone, joining one of a company of traveling entertainers that occasionally made the rounds of the small centers of

population. He was not to see her again for years.

Her absence decided him. Without her, it seemed to Daniel that all the glow had disappeared from the haunts of his boyhood. He had completed what passed for schooling at Amber Grove and his parents did not oppose him when he asked to go on with his education. A vague dissatisfaction and yearning decided him against one of the many small school towns. He selected New York City and Columbia University.

New York was a dying giant whose throes had been prolonged for a longer time than those of the other great cities. The glamour clinging to the man-made cliffs and canyons still drew a few tourists of means and permitted some facilities to operate. A degenerate industry clung to the opposite Jersey shore and some commerce continued to enter its vast basin. The seat of government had also at last returned, fleeing from dead Washington. The present scanty population of the city hardly sufficed to fill the most gracious of its former great hotels and these, being virtually without facilities, offered a spartan existence as compared with the air-conditioned wombs of the great Trees. With completely unconscious irony the inhabitants of the Waldorf Towers thought of themselves as voluntary primitives, leading the more natural life of an older and harder pattern, while everywhere about them loomed

the fading magnificence of dying glory.

Except for Columbia, New York's great universities had disintegrated, their inheritance passing to California because of the latter's tremendous climactic superiority for florachemistry, the new queen of the sciences. Columbia alone offered competent training in the poorly regarded physical sciences and maintained herself in the proximity of surviving industry.

Daniel, undecided and malleable, soon succumbed to the influence of the Manhattan Clique, which was not the name of a group so much as an attitude shared by everyone in the city; if you disliked the Trees and the *status quo*, you were a member of the Manhattan Clique. There were a myriad of schemes, Utopian or atavistic, for a newer or older order of things, and the University was naturally the center of feeling. It was this influence and his friendship with Robin Wark that led him to the extreme step of undertaking the study of physics and mathematics with atomic physics as his goal.

Robin Wark was the acknowledged head of the mythical Manhattan Clique. Descendant of Peter Wark, the founder of florachemistry, he was burdened like every Wark before him, with a great ancestral tradition. His reaction took the form of damning the Warks and their work. Nevertheless, he was a florachemist teaching a course of his own devising called Planetary Ecology and conducted research in plant bio-

chemistry. He, too, was engaged in the production of a new and perfected flora, but his plants were literally not of this world. They were, in fact, designed for Venus, and could he have planted them there, they would in the course of a few centuries have so altered the atmospheric and climactic environment of the evening star as to transform it into a fertile and comfortable home for mankind. His notions for the transportation of these productions to their intended home were as hopeless as they were ingenious. He was sure, however, that if he could succeed in this venture men would again respond to the challenge of a new world to win, especially in the face of future overpopulation, which he freely and cheerfully predicted.

Meanwhile Daniel was spending the happiest years of his life. To him, as to so many before him, a new world unfolded. It was a world revealed in mathematical equations and inhabited by ultimate physical particles, and his enthusiasm and ability were such that his teachers had every reason to be satisfied. Moreover, in his graduate years and later as instructor at Columbia he became a great proponent of the Manhattan Clique, and its unofficial expert in all discussions dealing with physical energy. The prospect of a new power era was not dead, he contended; atomic energy was still in the picture, although no one had found anything better to do with it than hide it in bombs. Fast fission had never been controlled and even

the piles were gone now, being too massive and demanding for this new ruralism. But hydrogen fusion! Let a solution be presented that eliminated the heavy atom starter and there might be a new beginning. Even Robin's dream might come true then! Meanwhile Columbia still had a cyclotron and apparatus for the preparation of heavy water and Daniel experimented.

*"Behold the brilliant sun
In all his splendor!"*

The words of Madeleine's song spoke in his own mind. Behold the brilliant sun! A little sun on earth! Clark's Star! It burned underground the world over; even here, now, in Amber Grove, nourishing the ruralism it was intended to destroy. It burned to ashes Daniel's ambitions, and Madeleine's, and those of the whole Manhattan Clique. But how this small sun thrilled him when first it arose in his imagination! The idea came in a single intuition that the following weeks of calculation and experiment proved true. His associates in the Columbia Physics Department smiled at his first disclosures and then became equally fanatical. Robin walked in a dream. And then came the impossible task of building the thing.

It was obvious that the Hydrogen Fusion Reactor was going to take an amount of labor and special materials that were seemingly impossible to assemble in that decadent era. As this fact sank into Daniel's

consciousness, his first elation gave way to despair. But he counted without Robin Wark and the Manhattan Clique.

Apart from the Columbians, probably the most ardent members of the Manhattan Clique were those men who directed the industrial residue on the Jersey shore. These men, heirs of a dream of power and unlimited industrial enterprise, spoke of the old days as one speaks of sacred things. Robin, who had friends among them, arranged an appointment for Daniel with Martin Brennan. Daniel spent several days reducing his idea to a layman's comprehension.

The meeting took place at one of those small cafés which still hung on in New York. Brennan was a great, hulking fellow who would hardly be distinguished from one of his own longshoremen, but he was a captain of industry, such as it was. Robin made the introduction. They ordered drinks and Brennan began at once:

"To begin with, Dr. Clark, I'd like to tell you that I've already checked with Columbia and the people at the Physics Department there vouched for both you and your idea. I couldn't be too sure of what Robin had to say. His enthusiasm sometimes carries him away." Robin grinned and Brennan continued:

"I want to say also that I'll give you any help I can if it will start new blood flowing in the veins of this corpse they call a civilization. Suppose you tell me what you're up to so I can understand it. I was trained

at Columbia in design engineering; atomic physics is a little out of my line."

"I'll do my best. First do you happen to know the principle of the old hydrogen bomb?"

"I was supposed to know it in college of course, but that's a long time ago."

"Well, the method is the old Atkinson-Houtermans-Gamow-Teller process," even Daniel smiled at the string of names. "Suppose you had a large number of deuterons, that is, nuclei of heavy hydrogen atoms, as in a sample of heavy water. Imagine that they are exposed in a region of high energy flux such as exists in the neighborhood of a plutonium bomb explosion, for instance. What will happen is this: Two deuterons which have acquired high energies of translation will collide at high speed and fuse to form an isotope of helium with the release of three million electron volts of energy. A neutron is also formed in the process and transfers its energy to another deuteron by collision. The process repeats itself and there is a chain reaction."

"In other words," said Brennan, "the hydrogen bomb."

Daniel nodded.

Brennan smiled. "The three million electron volts sound interesting but it seems to me that a plutonium bomb explosion is a little extreme for industrial operation."

Robin broke in: "There's where Dan's idea comes in. He's got it down to the dimensions of a bubble!"

Daniel gasped at his friend's un-

derstatement. "It'll be a big bubble! Look at it this way, Mr. Brennan: the real problem is to supply the energy to the deuterium nuclei so that the high-speed collisions can take place. In fact, the sustaining point of the reaction is in the neighborhood of eight hundred thousand degrees centigrade—"

Brennan snorted. "Do you expect me to take this seriously? There isn't a substance known that wouldn't be a thin gas at that temperature!"

"Wait a minute; here's the idea in a single dose: the reaction is designed to run in the center of an evacuated sphere. By the time the radiation reaches the walls of the sphere it will be distributed according to the inverse cube law and the energy per unit area of shell surface will be something that can be handled. A circulating fluid in the shell, perhaps gaseous mercury or liquid silver, will act as a coolant to keep the shell below its melting point and will serve also as a heat exchange agent coupled to an engine to perform useful work. If mercury were used, some sort of turbine would be a convenient apparatus."

Brennan chewed on it a while and nodded. "Sorry if I snapped; I'm beginning to get the idea. All that's necessary now is to get the deuterons packed in the center of the chamber, get them up to eight hundred thousand degrees, and keep 'em coming!"

"I think it will be easier to explain if we consider the reaction in operation. The internal shell wall

will be at white heat, limited only by the melting point of the material, and in that condition it will both radiate and reflect back into the reactor an appreciable part of the reaction energy. Since the shell is spherical, the focus of this radiation will be at the center. Now about those eight hundred thousand degrees: a *temperature* of this order is really meaningless, since the ordinary concept of temperature reduces to just a molecular jiggling. What is important is the energy flux per unit volume or the number of high energy photons passing through a given volume at a given time. If the focus is sharp enough, the energy flux at the center of the reactor will be sufficient to initiate the required deuterium-deuteron collisions.

"Now suppose that deuterium beams which have been highly accelerated are focused at the center of the sphere. Since they are of like positive charge they will repel each other and the result will be a momentarily compressed cloud of high deuterium concentration at the point of greatest energy flux, which is the condition for initiating reaction. The reaction will propagate and then damp out almost instantly for two reasons: the first is that the region of high deuterium concentration and therefore of high collision probability, is very small. The second reason concerns the immense radiation pressure generated by the chain reaction, which will disrupt the deuterium cloud and the ion beams.

After dampout and dissipation of the energy to the walls of the sphere, the ion beams realign and the process repeats. For additional control we could actually run the ion beams in timed pulses. Some of my colleagues believe it is possible to use gaseous deuterium or even heavy-water vapor jets instead of the ion beams but the decrease in sharpness of focus would mean a larger sphere."

"This reaction of yours will be intermittent then. A sort of variable star."

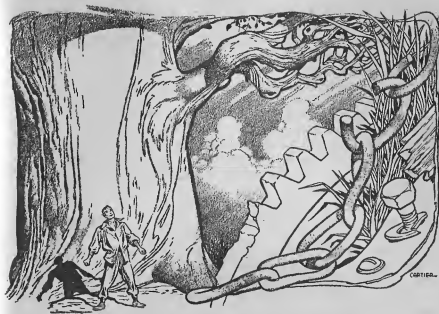
"Fortunately, yes. No scheme would serve to handle the energy output of a continuous chain reaction."

"You've shown how the process would maintain itself, once started. How do you get the sphere up to temperature to begin with?"

"That's no problem; we could run the mercury coolant in reverse to heat the sphere from an external energy source. The thing will be insulated of course, probably buried underground for radiation protection."

"And the deuterium? I understand that heavy hydrogen is an expensive item."

"It's cheap enough for this use. Besides, we could easily breed deuterium by proton-proton collision if we diluted our deuterium with ordinary hydrogen. The reaction product would be collected on a negative grid and drawn off. Furthermore, there is another reaction using ordinary hydrogen that runs at a higher temperature and which can be sub-



stituted after the required energy flux is established. This process goes by successive collisions from hydrogen through deuterium and tritium to ordinary helium. The energy output is even greater than in the AHGT reaction but the higher temperature requirement would mean a larger sphere."

"Could you give me some idea of the apparatus itself, the dimensions involved, materials of construction, and so on?"

"I'll outline our present thinking. The material for the inner lining of the sphere will be graphite brick. Carbon begins to sublime at thirty-five hundred degrees centigrade, far above any known metal or alloy, and will permit us to keep the dimen-

sions of the shell small. It is also a good heat conductor at high temperature, quite as good as steel. That will enable a high rate of energy take-off by the coolant which will circulate through it. Carbon also has the required chemical inertness toward the coolant, which will be mercury or some other low-melting metal. There will be some unavoidable reaction of the shell wall with unreacted hydrogen or deuterium as well as nuclear reaction of the shell material by neutron capture. In the case of carbon these products will be gases at the reaction temperature and can be efficiently removed. Finally, graphite brick is cheap.

"We have devoted a good deal of calculation to the probable dimen-

sions of the sphere. Assuming that the ion beams and energy flux can be focused within a space of one cubic centimeter, the reaction sphere will be no greater than five meters in radius for the AHGT process run at three thousand degrees wall temperature. A two-meter radius would probably work but I think we should adopt the larger figure in our first model to give us an efficiency factor to play around with. If we intend to use ordinary hydrogen, the sphere will need a radius five times greater, but I would be inclined to build the smaller model first."

Brennan sipped his drink and thought. He said nothing for a long while. Finally he shook his head as if to clear it of an unpleasant thought.

"I'd like to congratulate you for the ingenuity of your solar furnace," he said at last. "I assume it will work. You're the expert in the field, after all. But if you assume that your invention will put new ideas into the heads of the yokels and tease them out of their Trees, you're most sadly mistaken. A solar furnace four yards across; practically a package unit! That's what the bushmen have been screaming for! Up to now they've been starving for energy in their hollow trees. Now they're going to get it in little magic bubbles; small, cheap, inexhaustible and practically eternal!"

Daniel protested: "All right, that can be the lure. But once they swallow it, they'll have to accept the need of an industry to build and main-

tain them and a science to develop and perfect them!"

"Why? Almost everything you've described could be built by a good machinist! When I came here I was afraid that I would have to listen to some impossible idea. It's the other way around. Your star is little enough to hide in the woods and simple enough to be handled by country mechanics. As for perfecting it; what for? It's good enough for their purpose as it is."

Daniel sat in stricken silence. Brennan said more softly:

"Don't worry, Dr. Clark. I'll light your little star for you. It will mean the end of our dying operations in Jersey and it will finally put New York out of its misery, but it's too good an idea to let die. The old guard might as well go out in a blaze of glory. Your star will burn at our funeral."

*"A sun I know of
That's brighter still!"*

Daniel's thoughts kept pace with the song. He remembered how his star rose from the earth and burned in the sky, a second sun!

Robin was working with his plants, carefully adjusting them to a synthetic environment analogous to that of Venus, when Daniel burst in. "Robin, get your plants packed. They're going home!"

"Take it easy, Dan. You sound as if your talk with Brennan has finally snapped that cool, lucid brain!"

"Brennan! Yes, we'll need him.

Listen, poke a hole in the reactor. What have you got?"

"A broken reactor."

"You're wrong. It's a *rocket motor*, driven by radiation pressure and flying nuclear particles. Brennan is right, the reactor isn't enough. We'll give them heaven, too! On to Venus!"

The following weeks were the most exciting that Daniel remembered. For the first time in his life he was busy with positive activity leading toward a clear and attainable goal. Brennan undertook to build the rocket but kept a tight rein on enthusiasm:

"Let's publicize the trip," Robin had proposed. "We'll give stories to the newspapers and the radio and get the country excited about it. At least people will start thinking about other things than their Trees."

"Where do you think you are?" Brennan demanded. "Back in the time of the national press associations? Or are you referring to the mimeographed gossip sheet of the Manhattan Clique when you speak of newspapers? And we will *not* let the official government radio in on it! Apparently you don't realize that the Jersey shore industry is practically government controlled. They'd come down on us like a ton of bricks if they found we were wasting essential resources, there's little left as it is. No, this is top secret stuff. We'll lay out the launching site in the Jersey marshes and call it something else. At take-off I'll arrange to have a government representative

present and all the agents of local papers that I can dig up. Till then not a word."

So they called it the Manhattan Project for two reasons and kept quiet while the bugs were ironed out. And it was easy. It seemed as though Clark's Star was born to fly. The problem of steering the rocket was solved by providing for slight changes in focus of the ion beams. And the operation of the reactor while in atmosphere, a point which worried everyone, was shown by calculation to be feasible; once in operation, radiation pressure would prevent the entrance of air. The chain reaction would be initiated while the rocket rested in the launching site, the cradle forming an integral part of the reactor shell. Thus evacuation of the composite sphere was possible. Only that portion of the shell formed by the cradle would be channeled for the mercury coolant, or in this case, the heating element. The rest of the shell would be heated by radiation from this portion. Even radiation danger was at a minimum; transportation products would boil out of the carbon shell into open space at reaction temperature.

Daniel had daily conferences with Brennan in which each of the two men learned to respect the abilities of the other. Robin was busy with his plants, and Charles Remington, professor of astronomy at Columbia and the rocket's third intended occupant, pored over his equations.

*"This sun, my dearest
'Tis nought but thee"*

A few days before take-off Daniel met Madeleine for the first time since Amber Grove. Her story was a simple one of unhappiness and defeat. She had toured the country for years with a group of dancers, singers and raconteurs, and while many had listened and marveled at her voice, none was touched. The truth was that the traditions and disciplines of an art which embraced both performer and audience had perished from the land. The old works and attitudes lost their meaning when the culture which served as their frame of reference evaporated, and the new order provided a barren environment for artistic creation. Madeleine meditated a last effort in New York. Beyond that, she had no plans.

In the few days remaining before the trip, Daniel and Madeleine rediscovered each other. Together they wandered through the deserted parts of New York and wondered at departed magnificence. Together they looked out over the city from the Empire State tower, still serviced by a lone elevator for the tourist trade. And together they sailed in the great harbor in a boat Daniel borrowed from Martin Brennan. Madeleine even sustained one triumph in New York, small but sweet, when Daniel arranged for a performance at Columbia. The auditorium was filled by friends of Daniel and Robin, ardent members of the Manhattan

Clique, most of whom were in on the secret of the flight. In their exhilarated state they found the performance highly acceptable.

Of course Daniel told Madeleine about the Manhattan Project and communicated his enthusiasm to her. Secretly she was chilled by the knowledge that Daniel was to be one of the crew, but of this she was wise enough to say nothing. Instead she laid plans to celebrate his return with a recital to be composed entirely of songs of aspiration and victory.

Of the flight itself, Daniel's memory was unclear. He remembered only the confusion and agony of the launching. The small group of newspapermen and government officials, who had been gathered and informed at the eleventh hour, together with co-workers of the Manhattan Project watched the rocket break upward at an acceleration much greater than had been intended. Robin Wark and Charles Remington escaped disabling injury but Daniel spent the flight in a haze of torment with a crushed arm and a fractured thigh. Only his hysterical protests prevented the abandonment of the flight.

One moment in mid-passage he remembered clearly; it was during a lucid interval when his fever had temporarily abated and he looked through the port to see the stars in clear space. A sense of loneliness and terror swept through him. He shut his eyes, and with every fiber of his being, tried to imagine himself back in the warm safe Tree in which he

had been born. An intuition came to him that time had run out on the race of man and whatever the result of the flight, the effort was doomed; that a soul born and nurtured in the warm womb of a Tree needed more than a thin steel shell to shield it from cold space and the stars.

Nevertheless, Venus was attained. Without shedding its motor and gliding, the rocket could safely penetrate only the thinnest fringes of the atmosphere, and nothing could be seen of the surface of the planet through the eternal clouds. So Robin sowed his seed blind over the invisible world. The bacterial cultures were simply sprayed out. Some seeds were dropped enclosed in little nutrient capsules which also contained nitrifying bacteria, hoping they would fall on dry land. Others, buoyant and designed to germinate at slight ion concentration, would float indefinitely until cast on shore and washed by rain. Diatoms and algae were permitted to fall in solidified nutrient gelatin droplets. Provision was made for a later flora which could flourish only at a time when terrestrial conditions would prevail, after the early species had done their work. These went down in finned time-bombs containing two explosive charges. The first blast would clear away accumulated overlying deposits; the second would fire the friable seed containers into the air. So Venus was fertilized and the rocket went home.

Daniel remembered the approach

to Earth, tail-foremost. He remembered the screaming glide after the motor was jettisoned and he remembered nothing more. The deceleration and the rough landing finished him off.

He emerged into clarity weeks later in the Columbia infirmary to find Madeleine beside him, pale and drawn. She had been in a purgatory all her own during the flight and afterwards, while Daniel lay in a coma. She helped nurse him through convalescence. Robin was his first visitor.

"Well, we did it Robby, in spite of everything!" Daniel was full of plans for improvements and added controls which would have prevented the near-tragedy of the first launching. "Next time there'll be no slip-up!"

Robin smiled crookedly.

"What's the matter, we're a success, aren't we? Space is wide open now!"

"Not exactly, Dan. There will be no next time."

"I don't understand. A little accident isn't enough to stop us!"

"That's not it. Remember Brennan's prediction? He was right. The government has taken over his operations. They're devoting all available resources to turning out small models of your solar furnace to warm up the woods."

"Surely they can spare something for us."

"Well, they won't. They actually had Brennan in the clink for a while because he offered resistance. Now

he's seen the light. He'd rather cooperate than lose his job altogether. Those factories in Jersey are the most precious things in the world to him."

"How long have I been here? I'll be up tomorrow if I have to crawl! Wait till I get my hands on that bureaucracy downtown!"

"There's no hope. I tried. You can tackle them if you want to; as the inventor of the hydrogen fusion reactor even the President wouldn't turn you away."

Daniel did not get out of bed the next day, or the next week. But when he was finally permitted to go he got his audience easily enough. The President sent him a handwritten note to the effect that he would be honored by a visit of the creator of the Hydrogen Fusion Reactor.

The President occupied a suite of rooms and offices in the old Whitehall Building on the lower tip of Manhattan, which, naturally enough, was always referred to as the White House. Daniel was shown in as soon as he appeared. Some of his pugnacity evaporated as he was greeted by the man with alert eyes in a tired, lined face. He held his peace during the opening remarks and the compliments.

The President offered him a gift; it was a tiny model of his solar furnace. The sphere was of spun gold through which could be seen the diamond star at the center.

"Mr. President," he said, "I came to ask for a gift of greater value."

"I think I can guess what it is."

"Don't you see that now, if ever, is the time to go on with the space project? Now, while there are still some men in the dying cities who think such things are precious!" Haltingly at first, Daniel tried to explain the foreboding he had experienced during the flight, when he first saw the naked stars. The eyes of the man opposite filmed with pity.

"Dan . . . Dr. Clark," he said, "please listen. I was born in a Tree in Wisconsin, near a place called Five Orchards, where I must have spent very much the same kind of boyhood that you did. Like you, I came to New York and fell under the spell of the old magic. Oh yes, I know all about the Manhattan Clique, you might even call me a distinguished fellow-traveler. I once had the same hopes and dreams that you speak of now; perhaps I still have them. But those dreams were born out of season, like a plant that germinates at the edge of winter, after the first snow has fallen. You ask me to divert a part of our effort to the building of rockets, but my advisers tell me that our industrial potential is so small that even our plans for the production in quantity of your solar furnace may not succeed. On those plans depends the existence of millions of people in comfort or in misery. I, too, may dream of the stars and regret the stolidity of our rural society, but my oath of office and my duty to the people compel me to support it. I cannot abandon it to starvation and enlist

our few remaining resources in the service of a new, more glamorous mistress. The stars must wait—perhaps forever.

"I agree, Daniel, that you deserve a greater gift than this little globe. Still I hope that you will accept it in return for your gift to us, a safe and uncomfortable survival for man on Earth. You offer the stars also, but in this era of small capacity and limited objectives we cannot reach so far."

In the exit of the White House, Daniel read the inscription at the base of the sphere: *To Daniel Clark, who brought fire from the sun to warm a frozen world.*

Madeleine's long postponed recital was scheduled that evening. She sang at Carnegie Hall, at which performances were still given on rare occasions. The weather was bitter, even for New York in midwinter, and her sparse audience sat chilled and unresponsive in the unheated auditorium. They were chilled in spirit also, for with the death of the Manhattan Project a pall of despair had descended upon the city.

And Daniel remembered how Madeleine wept in his arms in utter defeat after the performance, as she had done once before in Amber Grove.

"Oh Dan, there's no use trying any more. I want to go home!"

Please, Dan, let's go home to our Tree, at least there we'll be safe from these eternal failures. Maybe we can give each other the things we've tried so hard to find."

*"Thy face, so fair to see,
That now my sun forever will be!"*

As the last colored note trembled to silence, Daniel's mind struggled up from its trance as a dreamer wakes with regret from a dream of remembered beauty.

"That was beautiful, Maddy. Please sing it again."

*"O sole o mio,
Sun in all his splendor"*

And Daniel fell again into a mist of memory. *I made a star, he thought, and it bore me into the heavens. But like bright Lucifer it has fallen now and lies chained in a cell of charcoal and steel, buried in the earth. And the human race with its bright, rebellious dream of escape and far wandering lies chained with it and equally buried beneath the roots of these Trees.*

With aching nostalgia, he translated:

*O sole o mio,
Oh Sun of mine!
Oh my Sun!*

THE END



CARTIER

THE MONKEY WRENCH

BY GORDON R. DICKSON

ASTOUNDING SCIENCE-FICTION

*A perfectly logical machine,
that insisted on being logical at all times, would, still,
be a perfect sucker for certain questions . . .*

Cary Harmon was not an ungifted young man. He had the intelligence to carve himself a position as a Lowland society lawyer, which on Venus is not easy to do. And he had the discernment to consolidate that position by marrying into the family of one of the leading drug-exporters. But, nevertheless, from the scientific viewpoint, he was a layman; and laymen, in their ignorance, should never be allowed to play with delicate technical equipment; for the result will be trouble, as surely as it is the first time a baby gets its hands on a match.

His wife was a high-spirited woman; and would have been hard to handle at times if it had not been for the fact that she was foolish enough to love him. Since he did not love her at all, it was consequently both simple and practical to terminate all quarrels by dropping out of sight for several days until her obvious fear of losing him for good brought her to a proper humility. He took good care, each time he disappeared, to pick some new and secure hiding place where past experience or her several years' knowledge of his habits would be no

help in locating him. Actually, he enjoyed thinking up new and undiscoverable bolt-holes, and made a hobby out of discovering them.

Consequently, he was in high spirits the gray winter afternoon he descended unannounced on the weather station of Burke McIntyre, high in the Lonesome Mountains, a jagged, kindless chain on the deserted shorelands of Venus' Northern Sea. He had beaten a blizzard to the dome with minutes to spare; and now, with his small two-place flier safely stowed away, and a meal of his host's best supplies under his belt, he sat reveling in the comfort of his position and listening to the hundred and fifty mile-per-hour, subzero winds lashing impotently at the arching roof overhead.

"Ten minutes more," he said to Burke, "and I'd have had a tough time making it."

"Tough!" snorted Burke. He was a big, heavy-featured blond man with a kindly contempt for all of humanity aside from the favored class of meteorologists. "You Lowlanders are too used to that present day Garden of Eden you have down below. Ten minutes more and you'd

have been spread over one of the peaks around here to wait for the spring searching party to gather your bones."

Cary laughed in cheerful disbelief.

"Try it, if you don't believe me," said Burke. "No skin off my nose if you don't have the sense to listen to reason. Take your bug up right now if you want."

"Not me," Cary's brilliant white teeth flashed in his swarthy face. "I know when I'm comfortable. And that's no way to treat your guest, tossing him out into the storm when he's just arrived."

"Some guest," rumbled Burke. "I shake hands with you after the graduation exercises, don't hear a word from you for six years and then suddenly you're knocking at my door here in the hinterland."

"I came on impulse," said Cary. "It's the prime rule of my life. Always act on impulse, Burke. It puts the sparkle in existence."

"And leads you to an early grave," Burke supplemented.

"If you have the wrong impulses," said Cary. "But then if you get sudden urges to jump off cliffs or play Russian Roulette then you're too stupid to live, anyway."

"Cary," said Burke heavily, "you're a shallow thinker."

"And you're a stodgy one," grinned Cary. "Suppose you quit insulting me and tell me something about yourself. What's this hermit's existence of yours like? What do

you do?"

"What do I do?" repeated Burke. "I work."

"But just how?" Cary said, settling himself cozily back into his chair. "Do you send up balloons? Catch snow in a pail to find how much fell? Take sights on the stars? Or what?"

Burke shook his head at him and smiled tolerantly.

"Now what do you want to know for?" he asked. "It'll just go in one ear and out the other."

"Oh, some of it might stick," said Cary. "Go ahead, anyhow."

"Well, if you insist on my talking to entertain you," he answered, "I don't do anything so picturesque. I just sit at a desk and prepare weather data for transmission to the Weather Center down at Capital City."

"Aha!" Cary said, waggling a lazy forefinger at him in reproach. "I've got you now. You've been laying down on the job. You're the only one here; so if you don't take observations, who does?"

"You idiot!" said Burke. "The machine does, of course. These stations have a Brain to do that."

"That's worse," Cary answered. "You've been sitting here warm and comfortable while some poor little Brain scurries around outside in the snow and does all your work for you."

"Oh, shut up!" Burke said. "As a matter of fact you're closer to the truth than you think; and it wouldn't do you any harm to learn

a few things about the mechanical miracles that let you lead a happy ignorant life. Some wonderful things have been done lately in the way of equipping these stations."

Cary smiled mockingly.

"I mean it," Burke went on, his face lighting up. "The Brain we've got here now is the last word in that type of installation. As a matter of fact, it was just put in recently—up until a few months back we had to work with a job that was just a collector and computer. That is, it collected the weather data around this station and presented it to you. Then you had to take it and prepare it for the calculator, which would chew on it for a while and then pass you back results which you again had to prepare for transmission downstairs to the Center."

"Fatiguing, I'm sure," murmured Cary, reaching for the drink placed handily on the end table beside his chair. Burke ignored him, caught up in his own appreciation of the mechanical development about which he was talking.

"It kept you busy, for the data came in steadily; and you were always behind since a batch would be accumulating while you were working up the previous batch. A station like this is the center-point for observational mechs posted at points over more than five hundred square miles of territory; and, being human, all you had time to do was skim the cream off the reports and submit a sketchy picture to the calculator. And then there was a cer-

tain responsibility involved in taking care of the station and yourself.

"But now"—Burke leaned forward determinedly and stabbed a thick index finger at his visitor—"we've got a new installation that takes the data directly from the observational mechs—all of it—resolves it into the proper form for the calculator to handle it, and carries it right on through to the end results. All I still have to do is prepare the complete picture from the results and shoot it downstairs."

"In addition, it runs the heating and lighting plants, automatically checks on the maintenance of the station. It makes repairs and corrections on verbal command and has a whole separate section for the consideration of theoretical problems."

"Sort of a little tin god," said Cary, nastily. He was used to attention and subconsciously annoyed by the fact that Burke seemed to be waxing more rhapsodic over his machine than the brilliant and entertaining guest who, as far as the meteorologist could know, had dropped in under the kind impulse to relieve a hermit's boring existence.

Unperturbed, Burke looked at him and chuckled.

"No," he replied. "A *big* tin god, Cary."

The lawyer stiffened slightly in his chair. Like most people who are fond of poking malicious fun at

others, he gave evidence of a very thin skin when the tables were turned.

"Sees all, knows all, tells all, I suppose," he said sarcastically. "Never makes a mistake. Infallible."

"You might say that," answered Burke, still with a grin on his face. He was enjoying the unusual pleasure of having the other on the defensive. But Cary, adept at verbal battles, twisted like an eel.

"Too bad, Burke," he said. "But those qualities alone don't quite suffice for elevating your gadget to godhood. One all-important attribute is lacking—involuntarily. Gods never break down."

"Neither does this."

"Come now, Burke," chided Cary, "you mustn't let your enthusiasm lead you into falsehood. No machine is perfect. A crossed couple of wires, a burnt out tube and where is your darling? Plunk! Out of action."

Burke shook his head.

"There aren't any wires," he said. "It uses beamed connections. And as for burnt out tubes, they don't even halt consideration of a problem. The problem is just shifted over to a bank that isn't in use at the time; and automatic repairs are made by the machine itself. You see, Cary, in this model, no bank does one specific job, alone. Any one of them—and there's twenty, half again as many as this station would ever need—can do any job from running the heating plant to operating the calculator. If some-

thing comes up that's too big for one bank to handle, it just hooks in one or more of the idle banks—and so on until it's capable of dealing with the situation."

"Ah," said Cary, "but what if something *did* come up that required all the banks and more too? Wouldn't it overload them and burn itself out?"

"You're determined to find fault with it, aren't you, Cary," answered Burke. "The answer is no. It wouldn't. Theoretically it's possible for the machine to bump into a problem that would require all or more than all of its banks to handle. For example, if this station suddenly popped into the air and started to fly away for no discernible reason, the bank that first felt the situation would keep reaching out for help until all the banks were engaged in considering it, until it crowded out all the other functions the machine performs. But, even then, it wouldn't overload and burn out. The banks would just go on considering the problem until they had evolved a theory that explained why we were flying through the air and what to do about returning us to our proper place and functions."

Cary straightened up and snapped his fingers.

"Then it's simple," he said. "I'll just go in and tell your machine—the verbal hookup—that we're flying through the air."

Burke gave a sudden roar of laughter.

"Cary, you dope!" he said.

"Don't you think the men who designed the machine took the possibility of verbal error into account? You say that the station is flying through the air. The machine immediately checks by making its own observations; and politely replies, 'Sorry, your statement is incorrect' and forgets the whole thing."

Cary's eyes narrowed and two spots of faint color flushed the tight skin over his cheekbones; but he held his smile.

"There's the theoretical section," he murmured.

"There is," said Burke, greatly enjoying himself, "and you could use it by going in and saying 'consider the false statement or data—this station is flying through the air' and the machine would go right to work on it."

He paused, and Cary looked at him expectantly.

"But—" continued the meteorologist, triumphantly, "it would consider the statement with only those banks not then in use; and it would give up the banks whenever a section using real data required them."

He finished, looking at Cary with quizzical good humor. But Cary said nothing; only looked back at him as a weasel might look back at a dog that has cornered it against the wall of a chicken run.

"Give up, Cary," he said at last. "It's no use. Neither God nor Man nor Cary Harmon can interrupt my Brain in the rightful performance of its duty."

And Cary's eyes glittered, dark and withdrawn beneath their narrowed lids. For a long second, he just sat and looked, and then he spoke.

"I could do it," he said, softly.

"Do what?" asked Burke.

"I could gimmick your machine," said Cary.

"Oh, forget it!" boomed Burke.

"Don't take things so seriously, Cary. What if you can't think of a monkey wrench to throw into the machinery? Nobody else could, either."

"I said I could do it," repeated Cary.

"Once and for all," answered Burke, "it's impossible. Now stop trying to pick flaws in something guaranteed flawless and let's talk about something else."

"I will bet you," said Cary, speaking with a slow, steady intensity, "five thousand credits that if you will leave me alone with your machine for one minute I can put it completely out of order."

"Forget it, will you?" exploded Burke. "I don't want to take your money, even if five thousand is the equivalent of a year's salary for me. The trouble with you is, Cary, you never could stand to lose at anything. Now, forget it!"

"Put up or shut up," said Cary.

Burke took a deep breath.

"Now look," he said, the beginnings of anger rumbling in his deep voice. "Maybe I did wrong to needle you about the machine. But you've got to get over the idea that I can

be bullied into admitting that you're right. You've got no conception of the technology that's behind the machine, and no idea of how certain I am that you, at least, can't do anything to interfere with its operation. You think that there's a slight element of doubt in my mind and that you can bluff me out by proposing an astronomical bet. Then, if I won't bet, you'll tell yourself you've won. Now listen, I'm not just ninety-nine point nine, nine, nine, nine, per cent sure of myself. I'm one hundred per cent sure of myself and the reason I won't bet you is because that would be robbery; and besides, once you'd lost, you'd hate me for winning the rest of your life."

"The bet still stands," said Cary. "All right!" roared Burke, jumping to his feet. "If you want to force the issue, suit yourself. It's a bet."

Cary grinned and got up, following him out of the pleasant, spacious sitting room, where warm lamps dispelled the gray gloom of the snow-laden sky beyond the windows, and into a short, metal-walled corridor where the ceiling tubes blazed in efficient nakedness. They followed this for a short distance to a room where the wall facing the corridor and the door set in it were all of glass.

Here Burke halted.

"There's the machine," he said, pointing through the transparency of the wall and turning to Cary behind him. "If you want to communicate with it verbally, you speak into

that grille there. The calculator is to your right; and that inner door leads down to the room housing the lighting and heating plants. But if you're thinking of physical sabotage, you might as well give up. The lighting and heating systems don't even have emergency manual controls. They're run by a little atomic pile that only the machine can be trusted to handle—that is, except for an automatic setup that damps the pile in case lightning strikes the machine or some such thing. And you couldn't get through the shielding in a week. As for breaking through to the machine up here, that panel in which the grille is set is made of two-inch thick steel sheets with their edges flowed together under pressure."

"I assure you," said Cary. "I don't intend to damage a thing."

Burke looked at him sharply, but there was no hint of sarcasm in the smile that twisted the other's thin lips.

"All right," he said, stepping back from the door. "Go ahead. Can I wait here, or do you have to have me out of sight?"

"Oh, by all means, watch," said Cary. "We machine-gimmickers have nothing to hide." He turned mockingly to Burke, and lifted his arms. "See? Nothing up my right sleeve. Nothing up my left."

"Go on," interrupted Burke roughly. "Get it over with. I want to get back to my drink."

"At once," said Cary, and went

in through the door, closing it behind him.

Through the transparent wall, Burke watched him approach the panel in line with the speaker grille and stop some two feet in front of it. Having arrived at this spot, he became utterly motionless, his back to Burke, his shoulders hanging relaxed and his hands motionless at his side. For the good part of a minute, Burke strained his eyes to discover what action was going on under the guise of Cary's apparent immobility. Then an understanding struck him and he laughed.

"Why," he said to himself, "he's bluffing right up to the last minute, hoping I'll get worried and rush in there and stop him."

Relaxed, he lit a cigarette and looked at his watch. Some forty-five seconds to go. In less than a minute, Cary would be coming out, forced at last to admit defeat—that is, unless he had evolved some fantastic argument to prove that defeat was really victory. Burke frowned. It was almost pathological, the way Cary had always refused to admit the superiority of anyone or anything else; and unless some way was found to soothe him he would be a very unpleasant companion for the remaining days that the storm held him marooned with Burke. It would be literally murder to force him to take off in the tornado velocity winds and a temperature that must be in the minus sixties by this time. At the same time, it went against

the meteorologist's grain to crawl for the sake of congeniality—

The vibration of the generator, half-felt through the floor and the soles of his shoes, and customarily familiar as the motion of his own lungs, ceased abruptly. The fluttering streamers fixed to the ventilator grille above his head ceased their colorful dance and dropped limply down as the rush of air that had carried them, ceased. The lights dimmed and went out, leaving only the gray and ghostly light from the thick windows at each end of the corridor to illuminate the passage and the room. The cigarette dropped unheeded from Burke's fingers and in two swift strides he was at the door and through it.

"What have you done?" he snapped at Cary.

The other looked mockingly at him, walked across to the nearer wall of the room and leaned his shoulder blades negligently against it.

"That's for you to find out," he said, his satisfaction clearly evident.

"Don't be insane—" began the meteorologist. Then, checking himself like a man who has no time to lose, he whirled on the panel and gave his attention to the instruments on its surface.

The pile was damped. The ventilating system was shut off and the electrical system was dead. Only the power in the storage cells of the machine itself was available for the operating light still glowed redly on the panel. The great outside doors, wide

enough to permit the ingress and exit of a two-man flier, were closed, and would remain that way, for they required power to open or close them. Visio, radio, and teletype were alike, silent and lifeless through lack of power.

But the machine still operated.

Burke stepped to the grille and pressed the red alarm button below it, twice.

"Attention," he said. "The pile is damped and all fixtures besides yourself lack power. Why is this?"

There was no response, though the red light continued to glow indistinctly on the panel.

"Obstinate little rascal, isn't it?" said Cary from the wall.

Burke ignored him, punching the button again, sharply.

"Reply!" he ordered. "Reply at once! What is the difficulty? Why is the pile not operating?"

There was no answer.

He turned to the calculator and played his fingers expertly over the buttons. Fed from the stored power within the machine, the punched tape rose in a fragile white arc and disappeared through a slot in the panel. He finished his punching and waited.

There was no answer.

For a long moment he stood there, staring at the calculator as if unable to believe that, even in this last hope, the machine had failed him. Then he turned slowly and faced Cary.

"What have you done?" he repeated dully.

"Do you admit you were wrong?" Cary demanded.

"Yes," said Burke.

"And do I win the bet?" persisted Cary gleefully.

"Yes."

"Then I'll tell you," the lawyer said. He put a cigarette between his lips and puffed it alight; then blew out a long streamer of smoke which billowed out and hung cloudily in the still air of the room, which, lacking heat from the blowers, was cooling rapidly. "This fine little gadget of yours may be all very well at meteorology, but it's not very good at logic. Shocking situation, when you consider the close relation between mathematics and logic."

"What did you do?" reiterated Burke hoarsely.

"I'll get to it," said Cary. "As I say, it's a shocking situation. Here is this infallible machine of yours, worth, I suppose, several million credits, beating its brains out over a paradox."

"A paradox!" the words from Burke were almost a sob.

"A paradox," sang Cary, "a most ingenious paradox." He switched back to his speaking voice. "Which, in case you don't know, is from Gilbert and Sullivan's 'Pirates of Penzance.' It occurred to me while you were bragging earlier that while your little friend here couldn't be damaged, it might be immobilized by giving it a problem too big for its mechanical brain cells to handle. And I remembered a little thing

from one of my pre-law logic courses—an interesting little affair called Epimenides Paradox. I don't remember just how it was originally phrased—those logic courses were dull, sleepy sort of businesses, anyway—but for example, if I say to you 'all lawyers are liars' how can you tell whether the statement is true or false, since I am a lawyer and, if it is true, must be lying when I say that all lawyers are liars? But, on the other hand, if I am lying, then all lawyers are not liars, and the statement is false, i.e., a lying statement. If the statement is false, it is true, and if true, false, and so on, so where are you?"

Cary broke off suddenly into a peal of laughter.

"You should see your own face, Burke," he shouted. "I never saw anything so bewildered in my life—anyway, I just changed this around and fed it to the machine. While you waited politely outside, I went up to the machine and said to it 'You must reject the statement I am now making to you, because all the statements I make are incorrect.'"

He paused and looked at the meteorologist.

"Do you see, Burke? It took that statement of mine in and considered it for rejecting. But it could not reject it without admitting that it was correct, and how could it be correct when it stated that all statements I made were incorrect. You see . . . yes, you do see, I can see it in your face. Oh, if you could only look at yourself now. The pride of the

meteorology service, undone by a paradox."

And Cary went off into another fit of laughter that lasted for a long minute. Every time he would start to recover, a look at Burke's wooden face, set in lines of utter dismay, would set him off again. The meteorologist neither moved, nor spoke, but stared at his guest as if he were a ghost.

Finally, weak from merriment, Cary started to sober up. Chuckling feebly, he leaned against the wall, took a deep breath and straightened up. A shiver ran through him, and he turned up the collar of his tunic. "Well," he said. "Now that you know what the trick was, Burke, suppose you get your pet back to its proper duties again. It's getting too cold for comfort and that daylight coming through the windows isn't the most cheerful thing in the world, either."

But Burke made no move toward the panel. His eyes were fixed and they bored into Cary as unmovingly as before. Cary snickered a little at him.

"Come on, Burke," he said. "Man the pumps. You can recover from your shock sometime afterwards. If it's the bet that bothers you, forget it. I'm too well off myself to need to snatch your pennies. And if it's the failure of Baby, here, don't feel too bad. It did better than I expected. I thought it would just blow a fuse and quit work altogether, but I see it's still busy and devoting every

single bank to obtaining a solution. I should imagine"—Cary yawned—"that it's working toward evolving a theory of types. *That* would give it the solution. Probably could get it, too, in a year or so."

Still Burke did not move. Cary looked at him oddly.

"What's wrong?" he asked irritably.

Burke's mouth worked, a tiny speck of spittle flew from one corner of it.

"You—" he said. The word came tearing from his throat like the hoarse grunt of a dying man.

"What—"

"You fool!" ground out Burke, finding his voice. "You stupid idiot! You insane moron!"

"Me? Me?" cried Cary. His voice

was high in protest, almost like a womanish scream. "I was right!"

"Yes, you were right," said Burke. "You were too right. How am I supposed to get the machine's mind off this problem and on to running the pile for heat and light, when all its circuits are taken up in considering your paradox? What can I do, when the Brain is deaf, and dumb, and blind?"

The two men looked at each other across the silent room. The warm breath of their exhalations made frosty plumes in the still air; and the distant howling of the storm, deadened by the thick walls of the station, seemed to grow louder in the silence, bearing a note of savage triumph.

The temperature inside the station was dropping very fast—

THE END

THE ANALYTICAL LABORATORY

There's a rather interesting reaction apparent on the report sheet this time: "Success Story" came in second—but "Success Story" had more first-place votes than did "Izzard"! The answer, of course, is that opinions on "Success Story," which was actually a love-story in essence, were rather sharply divided. Science-fiction has shown a slight tendency to overlook such little points—that human emotional reactions are not logical, but very powerful factors in developing history.

MAY 1951 ISSUE

Place	Story	Author	Points
1.	Izzard And The Membrane	Walter M. Miller, Jr.	2.00
2.	Success Story	Julian Chain	2.14
3.	Galactic Gadgets	Harry Stine	2.93
4.	Key Decision	H. B. Fyfe	3.78
5.	Guess Again	J. A. Meyer	3.85

The Editor.

ASTOUNDING SCIENCE-FICTION

BOOK REVIEWS

"Solution T-25," by Theodora Du Bois. Doubleday & Company, Inc., New York. 1951. 218 pp. \$2.75.

Ability to write nearly twenty mysteries, some of them very good, for Doubleday's Crime Club turns out to be no guarantee that the author can write an original—or even unoriginal—book for the same publisher's science-fiction series. Theodora Du Bois, in her "Solution T-25," has turned out a very ordinary piece of fiction for either category. One suspects that it may have been intended as a "timely" mystery which didn't quite meet Crime Club standards.

At any rate, this is no more and no less than a story of a group of bright young things who nobly pretend to be collaborators after Asiatic Communists have overwhelmed the United States, in order to give a couple of super-scientists the time to come up with a super-weapon. Although there is much gnashing of villainous teeth, especially by a five-by-five female Commissar, and a fair amount of pseudo-ruthlessness and bloodshed on both sides, there is no particular suspense, no char-

actèr, and no science worth the name. Thanks to Miss Du Bois' following, the book will probably sell better than any of Doubleday's other recent science-fiction titles by writers who know what they are trying to do and how to do it.

P. Schuyler Miller

"Kinsmen of the Dragon," by Stanley Mullen. Shasta Publishers, Chicago; 1951; 336 pp.; \$3.50.

"This novel has not appeared in any form prior to this book publication" proclaims the jacket blurb. Few other s.f. books can make that statement this season, as the rash of pulp reprints continues. But Stan Mullen, himself a magazine contributor, has come up with a first-class first novel, blending astounding science with unknown wizardry. If "Kinsmen" somewhat invites comparison with the recently reprinted "Blind Spot" because of its world-beside-our-own theme, I dare the sacrilegious opinion that it surpasses the "Spot" in reader interest. In Annwyn, the invisible realm

BOOK REVIEWS

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we cannot sense, psychology is different, inventions strange, architecture alien; yet to the hero this Lorelei land offers a kind of haven in the end, away from the confusion of our own here and now. A splendid escape piece. The all-around technicolor wrapper by Bok puts the artistic whipped cream on top of this brandied literary plum pudding.

Weaver Wright

"Day of the Triffids," by John Wyndham. Doubleday, Garden City; 1951; \$2.50.

John Wyndham is an old-time English author known to fans of the first generation as John Benyon—"Planet Plane," "The Secret People," et cetera. He is now launched on a second authorhood via the serialization of "Triffids" first in *Collier's* and then hard covers. The triffids themselves, sentient floral menaces from outer space, are mainly offstage and of not too great consequence in the unfoldment of the plot, which is derivative—without being derogatory—of "Country of the Blind." In the Wells classic a man who could see came among sightless people who were adapted to the handicap. What would happen in our highly mechanized, civilized civilization if the majority of mankind suddenly became blind, with only a few sighted individuals remaining? This is the challenging

theme of Wyndham's extrapolation, which is extraordinarily well carried out, with the exception of a somewhat anticlimatic if perhaps inevitable conclusion.

Forrest J. Ackerman

"City At World's End," by Edmond Hamilton. N. Y.: Frederick Fell, Inc., 1951, 239 pp., \$2.75.

Ed Hamilton's latest hardshelled tome is run-of-the-mill science-fiction, demanding neither hosannas nor anathemas. It has mild virtues and venial faults, and will give a reasonable degree of entertainment.

Middletown, U. S. A., is blasted by an atomic bomb into the far future when the sun has run down and all other men have left the dying Earth for pleasanter planets. The Middletowners, a collection of Bradburyesque Little People, move, under the guidance of Scientist Kenniston, to an abandoned domed city to keep from freezing. A spaceship lands with representatives, human and otherwise, of the Federation of Stars, who announce that the folk from the past shall be evacuated to another planet, as is the Federation's wont with the people of worn-out worlds. The Middletowners object violently to going "off to the Moon or somewhere" and prepare to resist evacuation by force. Hero Kenniston, trying to smooth things over, learns a scientist has devised a method of re-

lighting burnt-out stars, but has been forbidden to try it—And you can guess how things go on from there.

The author has made a conscientious effort to rise above the space-opera level and has succeeded to a degree. In some places he has fallen into the pit of false motivation, however. Thus it is not credible that the Middletowners would get so wildly excited at the mere sight of an intelligent nonhuman that they would begin shooting at it without provocation. They would have heard of the little green saucer-pilots and so would not be too surprised. Nor would real Middletowners display such unanimous and fanatical devotion to the old sod; French peasants, maybe, but not restless, rootless Americans.

Still despite its moderate shortcomings, the story rates far above some of the real stinkers that have come out in the last few years.

L. Sprague de Camp

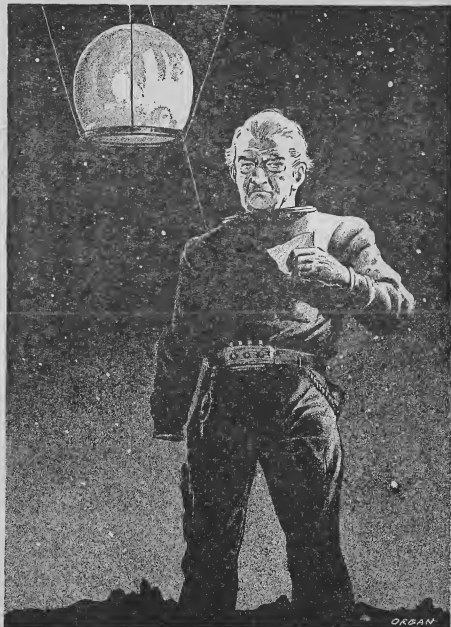
"Fear" and "Typewriter in the Sky," by L. Ron Hubbard. Gnome Press, N. Y.; 1951; \$2.75.

One way to become very familiar with a volume is to *proofread* it. This fell my lot with the present pair of yarns, gathered together under one cover. I got to know James Lowry's plight even more intimately than I had remembered it from reading of his flight into "Fear" in the year 1940 in *Unknown*. "Rats will eat you, James Lowry!" A younger Ray Bradbury was so impressed by this story that he once adapted part of it into play form and personally recorded it. In re-reading it I was struck by how close Hubbard had come in style to present day Bradbury. I question the publishers' classification of "Fear" as "psychological science fiction," but it is beyond doubt the most sinister study of aberration-cum-adumbration that Hubbard ever wrote.

The second novella, "Typewriter in the Sky," is almost pure swash-buckling adventure, with plenty of swash and barrels of buckle, and a chill and a chuckle off and betimes. Consider the predicament of a villain who battles valiantly to be a hero despite the power exerted over him by his master—the Author at the tyrannous typewriter!

Forrest J. Ackerman

★ ★ ★



THE PRICE

BY DAVE DRYFOOS

The ships weren't developed — the technology wasn't good enough. A man could go out, but not go back — nor had he the right to stop another generation seeking outward too —

Illustrated by Orban

Like a louse on a lion, the fear had got under his hair, bored into his skin, swelling and reddening as it ate at him. Like an inaccessible insect, it was too close, too nearly a part of him, to be coped with by claw or craft. He could only pretend it wasn't there. Hating the pretense, Ray Fincek hated himself.

He sat behind a cluttered desk that huddled between supply bins in the Building Maintenance Section of America's Moonbase. His grizzled head hardly topped the heaped-up papers on the blotter. His flat, thrice-broken nose pointed directly at a dog-eared telautograph message received from Earth the day before.

His brown eyes didn't see that message. Only his mind's eye focused, and with it he saw stars. Stars as they looked from space—cold in their hotness, close in their distant-

ness, and bright as the Everlasting Light that burned in its own stream of oxygen at the Tomb of the Unreturned, the monument to missing spacemen he'd helped dedicate there on the Moon.

The missing had seen those stars. In his mind's eye, in the memory that ran back to the beginnings of spaceflight, Ray Fincek saw those missing men. He saw their ships, the planets he'd visited with them, the asteroids, the satellites, the whole solar system in a panorama as wide as space and as long as his twenty years of space-work.

He told himself he hated every minute of it.

Still evading the message, his eyes came to rest on his left hand. It was calloused. It was also grimy—tattooed with the ingrained dirt that

comes from inadequate washing. The nails were filthy. They needed cutting, but they needed cleaning more, and that he could do by himself.

He drew a nail file from the center drawer of his desk, and gripped the blunt end with his lips. He bent over till the shaft of the file slipped between the open jaws of a small vise clamped to the desk's left corner. Then, holding the file in position with his lips, he tightened the vise around it.

He sat up, a swarthy, graying, flat-nosed gnome, broad back hunched to a question-mark. Patiently he drew each fingernail in turn over the sharp end of the file—not once, but repeatedly, until each was fairly clean. Then he buffed them all on his empty right sleeve.

By that time he was ready to face again the impact of the telautograph message. He could have recited it from memory but chose to read because it was in his son's own neat and incisive script.

Dear Dad,

Have been accepted as Ph. D. candidate in astrophysics and assigned an asteroid to study. Will stop off for parental consent. Janet sends love.

Twoie.

So he was going to see his boy. Just what he'd dreamed of, all those long years. Just what he'd always promised himself—after the next trip. Then suddenly, with an arm gone, there'd been no next trip—

and no assurance of a decent job, down Earthside.

His dream was coming true anyhow. But Twoie must hate him, after those long years of neglect; despise him as a stove-up has-been. Besides, the boy shouldn't be coming to the Moon. Dreams have no business coming true—

He should have known the boy would come, he told himself. He should have known from the day Lisa wrote she was naming their baby Ray Fincek II, instead of Junior—boasting that their child was not a junior-grade Fincek, but a chip off the old block. But he'd put that down to a woman's whim, and nicknamed the baby Twoie more or less after a famous atmospheric flier he'd heard of.

He should have known as soon as Twoie began studying astronomy. But he'd pictured a quiet lecture hall in an ivy-league college, an air-conditioned office in Pasadena or some place.

He should certainly have known a year ago when he'd grudgingly consented to his son's marriage; grudgingly, because he thought nineteen too young for matrimony, but consenting because he'd hated to think what he might be told—he, and everyone else along the Moon-base grapevine—if he asked why marriage was so urgent.

Janet, the girl's name was. He'd seen her with Twoie in the last Christmas Video Party that Earth-base held with Moonbase for morale purposes. The men had jokingly

complained Janet was bad for morale. "Too good-looking," they'd said.

He should have known that, too, Ray thought, sighing. He supposed he should have known a lot of things. But how could he, when he'd never seen his son face to face? All he really had of the boy was this handwriting, sent in a telautograph because that was the most personal form of message available to the public.

A very nice form of message to send to one's father, too—if the father were rich. Cheap enough, though, when you considered how far it had to travel. The price had been penciled on a corner by a message-center clerk: three hundred fifty-four dollars and sixty-five cents. Plus tax, of course.

The delivery boy, all excited, had refused a tip. Which was lucky, because it was still three days before pay day. No! Four! Twoie would be here in an hour—a check, in four days. It was a relief to have to get up and do something about that.

He unzipped a pocket of his patched red spacesuit and stuffed the message into it. He stood under his helmet, which hung on a cord from the ceiling, lowered it to his shoulders, uncoupled the hook, and made fast such thumbscrews as he could reach. He thrust his hand into a gauntlet held by a special frame, and made the wrist-joint more or less air-tight by catching the free end of a roll of friction tape on his

wrist, winding his arm around the tape-spindle a few times, cutting it against a knife-edge fixed there for the purpose, and smoothing the end against his chest.

Then he lurched bearlike through a couple of vapor-barriers, and was out in the cold, half-pressured corridor. His toes hurt. He turned on the heat in his suit, but got no relief. His toes felt as if curled in tight fists under the balls of his feet, driving long toenails into his soles at every step.

But here again, as he well knew, Ray Fincek was kidding himself. Since a spacesuit's heating unit had failed him, fifteen years before, he'd had no toes.

Probably the boy didn't remember hearing of that. Probably the boy didn't recall that he'd lost his arm to a meteoric dust-mote that pierced his suit, here on the Moon. Probably the boy hadn't pictured how he'd look, all crippled with the bends from sudden decompression in a landing accident.

Certainly the boy didn't know that forty-one-year-old Ray Fincek looked like a man of sixty and felt eighty. Too many things, the boy didn't know— But the main thing was, he didn't know the boy!

He knew only Martians. There was one in the corridor, working maskless and suitless in a thin and frigid semiatmosphere that would have spun a man fainting to the floor. It moved backward down the long narrow tunnel, watching its

progress in a mirror held in the right hand, and catching any missed spots with a rag held in the left. It walked on its two front feet, and in the two rear ones held buckets of soapy and clear water. Its left tail manipulated the wet mop and its right tail rinsed and dried.

Ray remembered to smile and wave an answer to the friendly undulations of the Martian's snout, but wasn't convincing. Quickly the Martian downed tools and stood at attention, every feather electric with a quivering desire to be of service.

Ray halted, pulled himself together, and reached up to pat the Martian's snout. Then he gave the signal to resume work. This time no willing Martian could help him.

The paymaster could. And he would, if asked. Asking was the hard part.

On down the corridor Ray shuffled wearily. He entered the Administration Wing's air lock, closed the door behind him, and sat heavily on the hard bench along the right wall. A red light flashed over the inner door, and pumps pulsed in his ears. The air grew hot. He turned off his suit-heat.

When the light changed to green, the inner door unlocked itself, and he got up and went through it.

A new little blond file girl, whose desk was just beyond, came up and began helping him remove his helmet. As he knew, she was stationed there to help all comers. But Ray Fincek had climbed unaided out of

his first spacesuit before she'd been born—and had climbed unaided out of his last one just before he'd lost that right arm. It was all he could do to accept her routine assistance without rudeness.

The blonde was lifting his helmet off when another woman bustled up, frankly fat, frankly forty, and frankly admiring.

"That'll do, Jane," she said. "I'll help Mr. Fincek myself."

"Mr. Fincek?" said Jane. "Oh, excuse me, sir. I should have recognized you from the pictures." She paused, looked hesitantly at Ray for a second, and then asked the older woman, "Miss Stoa, would it be wrong of me to ask for an autograph?"

Ray answered for himself: "Sure not! Just so you don't want it on a check. I'll stop by your desk."

Her brilliant smile so contrasted with his stupid joke that Ray sneered inwardly at himself. But he made another effort to live up to his reputation for wisecracking.

"Still got those pictures of your kids, Miss Stoa?" he asked the older woman, forcing a grin.

She giggled, and even managed a blush. "All right, Ray! Mrs., then! But Miss makes me feel younger—"

She fumbled with the zippers of his suit. "Want anything out of the pockets, Ray?"

"Yeah." He extracted his son's telautograph. "Got a letter from my boy."

Mrs. Stoa's eyes sparkled. "I . . .

we all heard, Ray. We're so glad for you!"

Ray just looked at her. She looked back at him, chins sagging.

"What's the matter, Ray? Don't you want to see him?"

"What do you think?"

"Well, what's eating you, then? This isn't like you, Ray."

"He's going up for his Ph. D.," Ray blurted. "I'm head janitor here—"

"You're chief of a crew of Martians that you yourself found and trained. They work for you because they like you—and so will your son!"

"Maybe—if he isn't sore because I spent years with the Martians and not even an hour with him."

"He'll understand—unless there's something wrong with him."

"Not a thing! Don't start that rumor, Felice!"

He felt ashamed as soon as he heard himself. He'd hurt her. He'd hurt others, too—like Twoie, and Twoie's long-dead mother, that he'd stayed away from so long.

He recalled the year's Moon-quarantine that formerly lay between a trip to a strange planet and an Earthside visit. He remembered thinking at the time that if he went home he'd arrive practically broke, and maybe have to take his boy out of school. But those memories he dismissed as alibis. Ray was sure he'd have gone if he hadn't lacked courage—just as he now lacked the courage to face his boy, or even apologize to Felice Stoa.

Felice had hung up his heavy suit and was breathing heavily.

"Everything will probably come out O.K.," she said. "Anyhow, you can count on us—"

She sounded doubtful! Thinking of that, he got halfway down the aisle to the paymaster's cage, within sight of the pale, poker-faced little man inside it, before recalling his promise to the blond file girl. On aching feet he shuffled back to her desk and signed his autograph.

When he finally got to the cage, the paymaster kidded him about that retreat: "For a minute, there, I thought you'd lost your courage."

"I have, Harry. Got to talk you into an advance."

"That would be for the boy now, wouldn't it? Well, there's the credit union, and your unpaid salary, of course—or if you like, Ray, I can let you have what's in my pocket."

"Thanks, Harry. There must be a week's pay I've earned since the last check—"

"All right. Sign here, while I dig up your payroll card. Boy, how I envy you! Haven't seen my kids in three years!"

"I envy you," said Ray. "You're not a total stranger to them. What's it like, getting acquainted with your own family?"

Harry glanced up in surprise. "Why, it's wonderful!" he said. "I get along just fine. And I'm only a clerk. You . . . you're Ray Fincek—"

Ray shrugged. "Even if Twoie likes me now, he won't when I tell

him what I'm going to tell him."

"What, for Pete's sake?"

"That he's got to go back to Earth! That he can't waste himself up here!"

Harry wet his thumb and counted out bills from a handful. "With me," he said slowly, "kids have a habit of doing what they want to do. But then, I'm not Ray Fincek."

"No," said Ray, painfully aware that a clerk has a skill that is salable on Earth, but a space-pilot hasn't, "no, you're not. Thanks for the dough, Harry."

The blond girl helped him into his suit again, Felice being out of sight. He went through the office to the transport air lock, walked through its outer door, and sat in the cylindrical car that waited there at the end of a tube. By remote control he opened the tube-gate at the blast-off point, and the few pounds of air in the lock drove him quickly to the field.

There was no traffic at the moment, but his climb up the steel ladder to the meteorite-proofed control room touched off a bustle of activity. A tall boy with a white junior's suit and a sharp face helped him through the manhole to the semicircular room, twisted the dial of Ray's suit-radio to the special flight-control frequency, and said a respectful, "Hello, sir." A dark boy, shorter than his mate and also white-suited, pushed the one comfortable swivel chair to the center of the plotting-table and stood at attention while

Ray seated himself. But the boy was elbowed aside by the chair's regular occupant, a tall man in a red suit like Ray's.

To this man, who took a stool beside him, Ray spoke.

"Well, Al," he said, "I see he didn't come in at Number Two site over there."

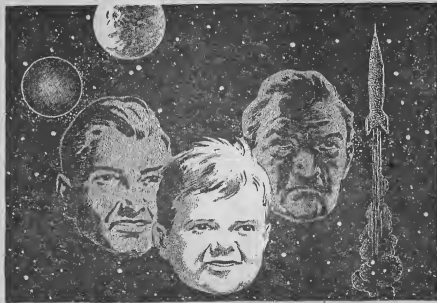
"No," said Al, "but he's here. The tractor's hauling him over from Number Four. I'll put him on C-Ring for blast-off, so he'll be right out there in front of us."

Ray was so intent on his son that he saw the tow-tractor's dust fountain as it might look to a boy fresh from Earth: every mote of dust or pebble of pumice sailing off the surface with whatever trajectory the treads gave it, uninfluenced by wind; all falling at the same speed, whether light or heavy. He remembered how unreasonable the effects of vacuum had looked to him when he first saw them.

Up here, though, everything was unreasonable. Any man who came here was unreasonable—

Watching the tractor haul its trailer bearing Twoie's slim single-seater, he thought of an ant pulling a twig. Strange thought—he hadn't seen an ant in years. When the gantry rolled up on its track and the armored crew hooked on to the ship, he held his breath, senselessly hoping they wouldn't drop it.

They didn't. They'd never yet dropped a ship. They set Twoie's on its tail as if it were a young tree be-



ing planted, instead of an unearthly dragon that would some day spout fire so fierce that safety demanded landings and take-offs be made from widely separated points.

Dragons, twigs, ants—and safety. The louse of fear was infecting his mind, Ray decided.

To snap himself out of it he made Al stay behind, and rode the tri-cycle to the blast-off ring alone. The boom was rigged, by then, and he started to climb it, but a gantryman insisted by helmet radio on hoisting him to the level of the air lock that had been clamped to the ship's hull.

When he spoke to the boy, his words were carried electronically still, though only a couple of hatches now separated them.

"It's Dad, Twoie," he said. "Stand by to receive me."

"Sure, Dad." He sounded as if Dad were a fellow you stood by to receive every day, as he trudged up from the basement, perhaps, after leaving some five-fifteen pneumocar.

The air lock was small, but pumping it up took time—interminable time, Ray thought. He found himself shaking, cramped. Several times Twoie tried to talk to him, but Ray could only grunt in reply.

It was just as well. The boy had a lot of instructions for the ground crew. Routine instructions, of course—they could have been recited by the ground chief if Twoie'd missed a cue—but the point, Ray decided, was that Twoie made them sound as rou-

time as they were. As if he'd had practice—though you don't practice Moonlandings—you just do them.

Ray found himself taking unexpected pleasure in the fact Twoie had done his so well. But then, he decided, men take perverse pleasure in all kinds of things.

He tried to seem agile when crawling through the inner manhole at the green light's flash. But he stood up in the cramped cockpit panting and sweating. The boy's lips were moving, but Ray had already shut off his radio and was awkwardly reaching around for his helmet's right rear thumbscrew. He didn't want a radio audience.

Twoie thought of that, too—turned off his throat mike before helping his father out of the helmet.

"Hi, Dad," he said. He had his mother's eyes—blue and misty. Ray remembered that mist—it had always been there when she'd watched him blast off.

"You're tall!" he said.

"Yeah—" He'd made Twoie self-conscious. "I guess you figured on a little Ray Fincek, and I'm not so little, any more. Still . . . they say I look like you—"

Like him? This arrow-straight athlete? Nuts! But no wonder he'd attracted a beautiful girl—

"How's your wife? How's Janet?"

"Fine! Sends her love. I've got some pictures of her in my wallet, here." He turned to a drawer for the wallet. Over a broad shoulder he said, "She made you a cake and a

muffler, Dad. This package, here. You can take it with you—"

"Take it? You mean you're leaving right away?"

"It's not that I want to—but I was delayed by a big sunspot storm that sent a lot of radiation around. They made me wait, and the Moon is moving the wrong way, now—"

So every minute they spent talking, deflected the ship's launching point. Stall long enough, and the boy couldn't go at all—

"Where are you headed?"

"Adonis. Want to check my charts?"

"No. The CAA has experts. I'm no Ph. D., Twoie. I'm janitor here—"

"Well . . . naturally your Martians do only the simplest kind of work—"

"Yeah. But this is a government job. You do the work of a head janitor, and some stupid Wage and Salary Analyst insists you get the pay of a head janitor."

"I . . . I know how much I owe you, Dad—"

"You owe me nothing!" Strain made Ray's tone explosive. "That isn't what I meant. I want you to have the best. The best of everything. But being a space-pilot isn't the best of anything. You've got to go back. I don't want you to go on. I won't give my consent to your going on!"

There! It was out. Not the fatherly, affectionate tone he'd hoped to achieve, but at least the cards were on the table.

Twoie trumped—and almost took the trick: "Don't you think I'm good enough, Dad?"

Ray reached with both hands for his son's shoulders—but felt him through only one glove. "Of course you're good enough! Too good! You've got a career ahead in some terrestrial observatory. You've got a wife—can raise a family. If you don't get yourself sterilized by radiation, up here—"

Twoie looked away, and Ray dropped his hand resignedly. He glanced around the cockpit. Some of the gadgets were strange to him. In this crowded place, where he couldn't even take off his suit unless Twoie first lay down in the bunk—in this cage, this coffin—were gadgets he didn't even recognize. Only five years since he'd piloted—and already his blood-won knowledge was getting obsolete!

"Dad—?"

"Yeah?"

"I . . . I don't know what to say. The last thing in the world that I want is to make you sore at me—But, look! Taking this flight even this far without your consent is illegal. I talked them into it because you were here. I mean, it isn't only that I have to turn back, if you don't consent—but all the people who let me take up the ship will lose their jobs. Mostly they're old friends of yours. They thought you'd be proud—"

"I am proud, boy—believe me! But—"

"But why refuse a signature,

then? It's just a formality."

"A death sentence is always just a formality—until it's carried out!"

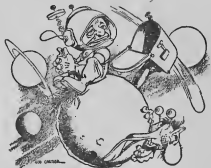
"Death sentence? But you're alive! Alive and admired and written up in all the textbooks!"

"Yeah—but my son still argues with me. You may never have a son, if you go on flying. I'm sterile, now, they say."

"But, they know more about shielding, nowadays. New alloys—"

It was a relief when the annunciator flashed.

Twoie plugged in a headset. "Tower calling," he reported, holding the receiver to his ear. "Microgram for Ray Fincek."



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"Put my helmet on me," Ray ordered. "Time enough for you to say I'm coming when I'm in the air lock."

He left his radio off so he could think, and it was only when he was going back to the tower that Ray realized they could have read him the message, and saved the time it took to pass the lock. Time—while the Moon jogged its course, moving his son's starting-point, requiring the use of additional fuel—if Twoie went on, that is. Well, of course that was nothing to worry about—

He read the message at the plotting-table, with the three dispatchers ostentatiously busy in corners. Then he realized there were two Ray Finceks in the world.

DARLING
IN SIX MONTHS YOU'LL BE THE
PROUD PAPA OF A SEVEN-POUND BOY.
KISSES. JANET

The dispatchers knew of it, of course, for all their polite pretenses. He felt their eyes on him, felt their hands itching to pummel his back.

He felt neither embarrassment nor pride—only relief. This was the out, the face-saver, the lifesaver. Now Twoie would *have* to go back.

He switched on his helmet radio. "Twoie may change his plans, Al," he said. "I'll go out and see him."

"I...uh... I wouldn't, Ray," Al said. "We're sure happy for you both. But two more trips through the air lock will take too long—he's behind his flight-plan already. I'll

give you a private frequency to talk to him on, though— Boy, what a send-off!"

Al's helmet was filled with grin, Ray noted. But he wasn't standing for any change in plans, just the same— And what the chief dispatcher wouldn't stand for, wouldn't happen.

But Ray had a card in his own hand. "You're the Dispatcher," he grunted, "but I'm the Consenter. Find me that wave-length, will you?"

Al laughed. "Whatever you say, Grandpa. I'll call the boy, first. To give him the channel."

Twoie was waiting when Al twisted the dial on Ray's suit and nodded his signal.

"Everything's fine," Ray told his son. "But sit down. I want to read you something."

He read. Deafeningly, Twoie howled his joy. Ray cut him off.

"Listen, this ties right up with what I've been saying. Now you *can't* go!"

"Of course I can! Now I've got something—someone new to do well for. *You* went, didn't you?"

"Yeah. And they don't allow children on the Moon, so today's the first day I ever saw you face to face."

"I know, Dad. And I didn't handle it well, did I? But don't you see, I want to go out there so much I've practically *got* to do it. Janet knows that—"

"Oh?"

"Look, Dad. I'm all set. The

tower called while you went after the message and gave me final clearance. I'll see you on my return trip. I'll stay longer—"

"How can you go and let your wife stay behind and have your son all alone?"

"How else do women have children?" Twoie was laughing at him! "I'm glad to be out of the way—babies are something I just can't bear!"

"It'll be more than a few months, with what quarantine and all. You may not see the kid for years!"

"They've cut down the quarantine period, Dad. The things you found out have made it easier for the rest of us."

"Never mind the apple-polishing," Ray said. "I'm still bound and determined not to give my consent."

"Listen! My name is also Ray Fincek. And I'm bound and determined to go!"

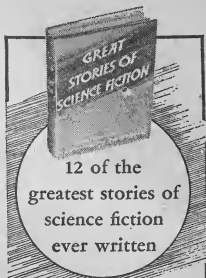
"At the price of not seeing your wife and boy for a long time?"

Silence. Then, "That'll be O.K., Dad. Just so my boy wants to pilot, too. Just so he wants to be like his Grandpa—"

The air went dead again, till Twoie asked, "Still there, Dad?"

"Yeah, I'm here," Ray answered heavily. "And I guess I'll still be here when you get back. Good luck, Twoie. I'll watch your blast-off."

But when the time came, he couldn't see a thing. His eyes were watering.



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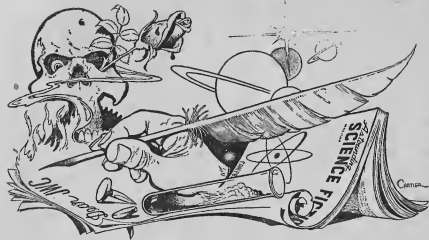
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BRASS TACKS

Dear Mr. Campbell:

When you get down to Brass Tacks—or in some other appropriate spot—I shall appreciate it if you will let your readers know that I am at work on the preparation of a Dictionary of Science Fiction terms. I shall be glad to have any words or phrases they may care to send me. These should be new words, or existing words in new combinations, or existing words given new applications or meanings. They should send, for each word, the meaning, the author, the title of the story, and the date of its publication.

I have a staff engaged in collecting science fiction terms, but always in such projects considerable help comes from the suggestions of in-

terested readers.—Joseph T. Shipley, 29 West 46th Street, New York 19, N. Y.

There ought to be a flood!

Dear Mr. Campbell:

Aren't both Mr. Weaver and his several attackers oversimplifying a subtle literary problem, common to all fiction dealing with people of the future, the past, or foreign countries: that of so rendering their dialogue that it's neither implausible nor unintelligible? Mr. Weaver says quite rightly—as his contexts show—that far too many of the future characters in the pages of ASF talk in

that highly local and concentrated slang characteristics of the U. S. A. in the mid-20th century. His opponents say, also quite rightly, that if it were possible to write the dialogue of the future as it will really be, it would be unintelligible to the present-day reader. But their claim that the future colloquial atmosphere can best be given by using 20th-century slang is no more justified than Mr. Weaver's converse claim.

The author's problem is simply to make his future characters seem probable future characters; just as it might be to create a probable Frenchman without making him talk French throughout, or a probable Anglo-Saxon *seri ditto ditto*. In the case of the Frenchman, it is neither sufficient that, when he's known to be "actually" speaking French, this should be turned into broken English with an occasional French word, nor that he should be made to speak perfect idiomatic English—though this is the best of the over-simple solutions—nor that he should speak slangy English. In the first case, one remembers that he is a Frenchman but knows that his speech is not faithfully reported, so that he is disproportionate with the other characters; in the other two, one simply forgets that he is a Frenchman at all, and any fictional significance this may have had disappears. The solution is, of course, to give a hint of Gallic idiom or structure to his otherwise perfect English.

People of the future are in exactly the same boat. In any future con-

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taining human beings at all, there will be a norm of speech regarded as "correct"; heads of universities, galactic co-ordinators, and so forth, are likely to approach this a good deal more closely than space-pirates or tramps. But even within the confines of "correct" speech there will be much variation, with individual character, of habits of speech. Therefore, to plaster *all* one's future dialogue with the same type of slang will not only make the distinction between tramps and professors invisible; it will make all characterization impossible. This is the trap into which the Smiths—E. E. and George O.—have fallen. Furthermore, the selection of the slang to be used from, and only from, a local contemporary source, makes incredible the suggestion that these proceedings could be in the future at all.

The solution, one which de Camp—one of the few writers who has given much attention to this question—has used with great success in "The Hand of Zei" and elsewhere, is to *invent* a few—not many—structural and/or idiomatic variations on modern English, and use them consistently.

May I conclude by quoting a fragment of an article which my time-machine has recently brought back from A.D. 3500 or so? It seems to be by a Venusian Professor of Literary Philology, who had been collecting remarks on the weather from various dates and sources as they might be rendered into Uni-

versal Language—here retranslated. He remarks that the last two seem "of doubtful authenticity," and I cannot but agree with him.

Terra: English primitive — Rain comes.

Terra: Medieval English — 'Twill rain anon.

Terra: 20th-cent. Eng. colloquial — Looks like rain.

Terra: 20th-cent. U.S.A. colloquial — Gonna rain.

Terra: 20th-cent. Eng. pedantic — It appears to be about to rain.

Terra: 20th-cent. French — One perceives that it will rain.

Terra: 20th-cent. German — It will rain.

Venus: modern colloquial — Comes rain.

Venus: colonial slang — Rain-skella primin'-up; jumpit!

Venus: local academic — The Universal *Djaba* seems to favor an aqueous microclimate for this tract.

Venus: Research Director Channing (23rd cent.?) — That cold front's going to louse things up if your brain-child doesn't jell.

Space: Galactic Co-ordinator Kinnison (30th cent.?) — Holy Klono's brazen et ceteras! *How* it's going to rain!

— John K. Aiken, 107 Marsland Road, Sale, Cheshire, England.

The Germans have the best answer: "Ha! Wetter!"

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TODAY IT'S TURBULENCE

BY R. S. RICHARDSON

It makes sense, once you get the drift, but it does sound strange that astrophysicists specializing in the structure of galaxies, suns, and star-clouds needed help from airplane designers and wind-tunnel experts!

A thousand years ago when astronomers found something in the sky they couldn't explain they said it was God.

A hundred years ago they blamed it on the ether.

Today it's turbulence.

Today if you don't know something about turbulence you're definitely a back number. Turbulence promises to be one of the handiest concepts introduced into astronomy since Encke invented the resisting medium. It begins to look as if you can explain practically everything in the sky if only you can invoke the aid of turbulence.

In the last half century astronomers have had to learn one new technique after another from photography to rocketry. Now they are

seeking help from people whose work by no conceivable stretch of the imagination could seem to have the slightest connection with the stars. Men who design submarines and airplane propellers, for instance. You attend a symposium on the structure of the universe and find yourself listening to a professor of hydrodynamics who has only a speaking acquaintance with astronomy but who can tell you what happens when you stir up a tank of water. Why? Because anyone who deals with fluids in motion must know something about turbulence. And there are very, very few people in the world today who really *know* anything about turbulence.

I fully realize how presumptuous it is for a person like myself even to



Fig. 1. The abrupt change from a straight smooth motion to an irregular fanlike shape suggests that in this solar prominence we may be actually witnessing the transformation from streamlined to turbulent flow.

think of attempting an article on turbulence. Unfortunately if we wait for the biggest authorities to tell us about their subject we are likely to spend most of our life standing around waiting. I can only hope that my remarks will convey enough information on turbulence so that you can at least look intelligent at mention of the word.

The concept of turbulence is comparatively new as things go in science. Apparently it was not clearly recognized in physics until around 1883, and it was not specifically applied to astronomical problems until 1928. Since then, however, turbulence has been steadily growing in importance so that today its implications are so vast that no corner of the universe is too remote to be safe from it.

The definition of turbulence in the dictionary sounds like an excellent description of life in the United States today. According to Webster, turbulence is "the state or condition of being violently disturbed, restless, or confused." The word has a slightly different significance in science. One of the first things you discover is that almost everything you learned about hydrodynamics in elementary physics is wrong, in the sense that the problems you encounter in nature seldom correspond to the simple examples given in the books. Most of us dislike turmoil and confusion in our daily lives and perhaps for somewhat the same reason scientists have shown an under-

standable tendency to shy away from such problems in the laboratory.

Apparently the first person to investigate turbulence was an Irishman born in 1842 named Osborne Reynolds. You will search for his name in vain in the encyclopedia. I sometimes amuse myself by taking a volume of the encyclopedia at random and turning the pages until I come upon something that catches my interest. I have found that encyclopedias are filled with the names of kings and conquerors whose only claim to immortality rests upon their record for villainy and general all around cussedness; and there are hundreds of medieval poets and writers whose dissipated lives seem to be remembered today chiefly for the books they wrote that no one by any chance ever reads any more. But men like Osborne Reynolds who really contributed to the advancement of mankind by working quietly in the laboratory and behaving himself are not even accorded passing mention. In fact, the chief honor Reynolds achieved was having a mathematical constant named after him, the so-called "Reynolds number."

Reynolds was an unusual type of college professor—a man who liked to work with his hands. He loved mechanical things; in fact, he tried to explain everything by some sort of mechanical analogy. For example, shortly before his death in 1912 he published a long treatise on "The

Sub-Mechanics of the Universe," in which he tried to develop a theory of gravitation based upon a granular structure of the ether. Needless to say this work was forgotten long ago. But his more prosaic sounding researches on the flow of liquids is still fine reading.

You must have noticed in working around your garden that when water runs from the hose at a low speed the flow is smooth and orderly or streamlined, but that at high speeds the flow is tumultuous and disorderly. Reynolds studied the flow of different fluids by using glass pipes. To find how the fluid behaved within the pipe he injected a tiny stream of coloring matter at one end in the center. He found that at low speeds the coloring matter flowed down the center of the tube in a smooth straight line. But upon increasing the speed there was a certain critical rate at which the coloring matter no longer flowed in a straight line but fluctuated wildly so that the whole tube became colored. Moreover, the transformation from streamlined flow to turbulent flow did not occur gradually but with astonishing suddenness.

Reynolds found that the change-over to turbulence depends upon four properties of the fluid under test: It depends upon the velocity and the density. It depends upon its viscosity. Viscosity is the tendency of different parts of a fluid to resist flow. For example, molasses on a cold morning has a lot of viscosity. Furthermore—and this is the impor-

tant point in astrophysics—whether turbulence develops or not also depends upon the *size of the system*. Some of the most remarkable things happen as the size of a system is increased. Treacle, for example, will flow as readily as water. It is said that if there were a river of treacle the size of the Mississippi the syrup would flow like water. While we can't try such an experiment we can observe an analogous case in the flow of lava. Lava is a highly viscous liquid but in great masses it runs down the side of a volcano almost as fast as if it were water.

It is evident, therefore, that the behavior of matter is profoundly changed if turbulence sets in. But turbulence is an exceedingly difficult subject to handle mathematically. In working up a theory it is much easier to assume that the simple streamlined type of motion still holds good as a fair approximation rather than the complex turbulent type. As a result, in the past there have been theories about the interior of the sun, the pulsation of Cepheids, the rotation of stars, et cetera, that were propounded as if turbulence didn't exist.

The first person to call attention to this painful fact was the Norwegian astrophysicist Svein Rosse-land in 1928. He argued that since the development of turbulence depends upon the size of the system, then motions in planetary atmospheres, in the stars, and in the nebulae must certainly be of this type.

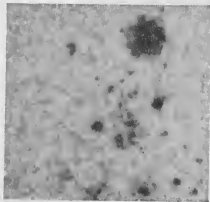


Fig. 2. The surface of the sun is not uniformly smooth and bright but is mottled over with millions of granulations. The average granule is about the size of the British Isles. They are moving up and down with a random velocity of about eight hundred miles per hour.

And once turbulence develops everything is changed immediately. The old rules no longer hold good. The coefficients of viscosity and heat conduction may be expected to increase by a million fold. Rosseland thought that in the solar prominences we might be able to see the actual process of transformation from streamline flow to turbulent flow. In Figure 1 you will notice that the prominence is smooth and regular in shape near its base and then abruptly fans out like the branches of a tree. The appearance favors Rosseland's idea although personally I am inclined to doubt if turbulence is all to blame. We know so little about prominences that it is hard to say what makes them behave as they do.

There is one case, however,

where everybody agrees that turbulence occurs. This is in the motions of the tremulous little clouds in the atmosphere of the sun called granulations. These granules have been the subject of a good deal of work lately. (The biggest and most spectacular looking objects in the sky are not necessarily the most interesting to investigate.) If you examine the surface of the sun through a telescope when the atmosphere is steady and the intensity of the light adjusted to your eye, you will see that the surface is all mottled over with bright and dark patches. I suppose it doesn't make any real difference whether you call the granulations the light places or the dark places, but it is customary to refer to them as the light ones. The old observers used to say that the disk of the sun looked like a plate of soup with rice grains in it. (Figure 2.)

Occasionally a granule will become bright enough so that you can distinguish it from the hundreds of others surrounding it. (Estimates of the total number of granules on the sun range from one million to nearly three million.) By concentrating hard you may be able to keep it in sight for about three minutes. But inevitably your granule will merge into others and lose its identity. Obviously the surface of our star is in a chaotic state, with currents of gas continually rising and descending and twisting about in all directions.

Now if there are currents of gas rising and falling in the sun's at-

mosphere we should be able to detect their velocities by the little shifts or "Doppler displacements" that they produce in the spectrum lines. Thus a granule at the center of the sun's disk due to a current of gas moving upward should cause a minute shift in a spectrum line toward the violet, while a descending current should produce a shift toward the red. Thus the lines in the spectrum of the sun instead of appearing sharp and straight should have a slightly ragged wavy appearance due to the innumerable little shifts produced by the granulations.

Astronomers have known this for years but it seemed hopeless to try to measure such small fleeting shifts in the spectrum lines. To get reliable measures the shifts should be registered by photography. But the exposure times were so long that the continually fluctuating shifts of the granules would have been smeared out into a smooth blur. Suppose that you tried to photograph people walking up and down the street by using an emulsion so slow that the exposure time was ten minutes. From such a photograph you couldn't tell whether a man was walking toward the camera or away from it. Their individual motions would have been all scrambled together. But with an emulsion fast enough to cut the exposure down to a fraction of a second you could tell at once which way a man was going.

Recently Dr. Martin Schwarzschild of the Princeton Observatory

and I were able to get some photographs of the spectrum of the sun that showed the velocity shifts due to the granulations. The photographs were taken at the 150-foot sun tower telescope on Mount Wilson that gives an image of the sun seventeen inches in diameter. By using new fast emulsions and a new grating that gave a brighter spectrum than before we were able to reduce the exposure time to three seconds, which was short enough to show the shifts of the granules without too much blurring.

Now regardless of how fast your setup may be, you can never hope to photograph granulations unless the atmosphere is exceptionally steady—"good seeing" as astronomers call it. (The ideal place to have done this job would have been on the moon.) On Mount Wilson you usually get the best seeing during the summer about half an hour after sunrise. Morning after morning we dragged ourselves to the sun tower, often arriving so sleepy that we had a hard time going through the program without pushing the wrong button or leaving a plate exposed. The exposure times were so short that by breakfast we had piled up a prodigious number of plates, enough to keep us busy developing the rest of the morning.

After toiling for weeks and taking scores of plates with the best technique we could devise, we found that our best exposure was one taken casually early in the summer for the purpose of testing the grating. We

never quite understood why that particular exposure was so much superior to all the others. Evidently everything that mattered—seeing, focus, figure of the mirror—was just right at the same time.

The piece of Scotch plaid in Figure 3 is a blowup section of this prize plate. The big white vertical bars are the lines in the spectrum of the sun. The horizontal light and dark streaks are produced by the granulations. (This is a negative print. Everything that is black in the picture should be white and vice versa.) But not all the spectrum lines you see there are produced by atoms in the sun. Some of them are produced by molecules of oxygen in the atmosphere of the earth. These atmospheric oxygen lines served as controls. For although they *look* like the lines of iron in the sun, yet they cannot possibly show any little wiggles due to granulations. I have often thought that this particular part of the sun's spectrum in the orange was put there by Providence for the especial benefit of solar astronomers. For the atmospheric lines told us whether we were measuring real velocities or not. If we found wiggles in the atmospheric lines the same as in the iron lines, we would know that our results were worthless. But we found that the iron lines gave quite different results from the atmospheric lines, much more definite than you might expect from looking at the photograph.

Imagine a line drawn around the

sun a few miles below the edge of the bright disk that you see in the sky. Our measures showed that the granules are moving up and down with respect to this line at an average velocity of eight hundred miles per hour. The average granule itself turned out to be around one thousand miles in diameter. To fix the idea in mind you can think of a granule as being the same size as the British Isles. The disk of the sun looks perfectly smooth but if you could see it at close range it would probably appear rough and uneven like the surface of a sponge when dry.

One reason Schwarzschild was interested in determining the velocity of the granules was that he believed they might be able to account for the terrifically high temperature of the solar corona. As you know, the origin of the coronal lines was for long a mystery. Astrophysicists used every trick in the book trying to explain those lines. The suggestion that they originated in the hypothetical coronium had never been taken really seriously. Finally in 1942 it was shown that the coronal lines came from atoms of iron and nickel stripped of from nine to fifteen electrons. Such highly ionized atoms explained the coronal spectrum beautifully. But you had to have a temperature for the corona of 1,000,000° K! When the temperature of the surface of the sun itself is only 6,000° K.

Schwarzschild has suggested that this high temperature is due to noise

made by the churning granulations. The sound waves start traveling upward through the sun's atmosphere. Near the surface the waves move without hindrance. But at great elevations in the corona where the density is low the energy of the waves is rapidly dissipated away. And the sound waves carry enough energy to raise the temperature of the coronal gas to the required value of a million degrees. The mechanism is similar to cracking a long whip. The motion of your hand at one end of the whip sends a wave scurrying along it that causes a crack at the end. Perhaps it never occurred to you that sound waves might raise the temperature of a gas. Somebody has calculated that the noise made by a hundred thousand people

cheering together at a football game would raise the temperature of the air above the stadium by some small fraction of a degree.

But to get back to turbulence. It now seems certain that not only is there turbulence in the atmospheres of the sun and stars but also in the vast clouds of gas scattered throughout the Milky Way or nebulae. Looking back we can see that our previous attempts to explain motions in them were doomed from the beginning. The motions undoubtedly are of a very complex character. The gaseous matter is continually agitated by eddies. An "eddy" is something peculiarly hard to describe. It is one of those words that everyone uses freely like "democ-

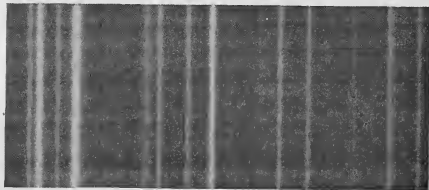


Fig. 3. The white vertical lines are in the spectrum of the sun. The light and dark horizontal lines represent streaks due to the solar granulations. The three strongest white lines arise from atoms of iron in the sun's atmosphere. But the weaker lines arise from molecules of oxygen in the atmosphere of the earth.

Notice that the three iron lines are slightly wavy and irregular along the edges due to minute Doppler shifts produced by the granules. But the atmospheric lines are nearly straight. The atmospheric lines served as controls. This portion of the solar spectrum is in the orange ($\lambda 6300$).

racy" or "temperature" but which few can define precisely. Roughly speaking an eddy in any disturbance that influences the smooth flow of a fluid. When you turn on your electric washing machine you create a lot of eddies immediately.

Suppose you were asked, "How big are the eddies in your washing machine and how fast do they move?"

You look inside and make a wild guess. "Oh, they're six inches in diameter and moving about a foot a second."

It is too bad that turbulence can't be described by an answer like that. The situation is much more complicated. What you have is a whole series of eddies of different size moving at different velocities. The largest eddies move the slowest. The smaller eddies move faster *up to a certain critical size*. After that the speed decreases slowly as the eddies get smaller.

You can find a nice analogy in the speed with which currency of different denominations circulates. Currency of large denomination such as five thousand and one thousand dollar bills circulate very slowly—big eddies—since there are few occasions to make purchases with that kind of money. But hundred dollar bills and twenties and tens circulate faster and when we get down to the poor devaluated one dollar bill we find it changing hands so fast that it is worn out after a few months. In our analogy the one dollar bill thus corresponds to the

eddy of critical size of highest velocity. But smaller currency such as half dollars and quarters—eddies smaller than the critical size—probably circulate a little more slowly than the one dollar bill.

As mentioned above, the granules that you can measure directly are apparently large eddies a thousand miles in diameter moving sluggishly at eight hundred miles an hour. But from other measures on lines in the solar spectrum which are too technical to describe here there are evidently much smaller eddies moving with velocities up to six thousand miles an hour. It would be very valuable to get direct proof of the existence of very small eddies, say a hundred miles in diameter. To do so would mean photographing the sun with a telescope of much larger aperture than has been used in the past. This is not so easy as it sounds. Camera fans may be interested to know that at Mount Wilson the direct photographs of the sun are taken through a deep orange filter on a very fine grain high contrast emulsion plate at $f/180$ with an exposure of one-thousandth of a second. The lens used is diaphragmed down to three inches aperture. Now imagine trying to take a shot at the sun with the 100-inch telescope at $f/5$! But indulging in such flights of fancy is of no avail since use of the 100-inch on the sun is taboo anyhow. Thirty years ago a couple of astronomers who were trying to measure the temperature of Mercury with the thermocouple turned



Fig. 4. The irregular forms of the light and dark markings in these vacant gaseous nebulae of the Milky Way are strangely suggestive of turbulent motions. Irregular Nebula in Sagittarius, NGC 6523.

the telescope on the sun. The night men claim the mirror never did recover from the shock.

Some of the ablest mathematicians have tried to develop theories of turbulence without much success. Usually they began by setting up equations that would describe the slow streamlined type of flow up to the point where turbulence sets in. But analysis along such lines is treacherous and has never yielded definite or conclusive results. It is now believed that such investigations never could have led anywhere, even if successful, for turbulence must be approached from a wholly different point of view.

We must start by first asking ourselves, "How is it possible for the ocean or the wind to display such a bewildering variety of motions?"

The answer is, "Because such bodies are free to move in so many different ways."

The bob on a pendulum, for example, is very restricted in its motion. It can swing back and forth and that is all. A football has much more freedom. It can move back and forth, roll end over end, and spin around all at the same time. Now the smooth streamline flow that we get at low velocities is only one way that water can move. But it can also move in countless other ways. It is as futile to expect that water will

always flow smoothly as it is to expect a brick to fly upward because all its molecules suddenly start moving with the same velocity.

Von Weizsacker has used turbulence to explain the origin of the solar system. He starts with a thin rotating sheet of gas with the sun at the center. Turbulence develops from conflicting motions within the gas. Eddy motion causes planets to condense at distances from the sun given by Bode's law. The theory attracted considerable attention when it was advanced seven years ago but now is largely discredited. But it has been of value in stimulating thought into new channels. For example, it is believed that the size of the galaxies was determined by the struggle between turbulent forces and the forces which led to the expansion of the universe. (Figures 4 and 5.)

Turbulence sounds as if it would be an awfully poor subject for poetry, yet some of the ideas involved have been expressed in verse, thus:

Big whirls have little whirls,
That feed on their velocity;
And little whirls have lesser
whirls,
And so on to viscosity.*

You can say it in symbols but it is easier to assimilate in verse.

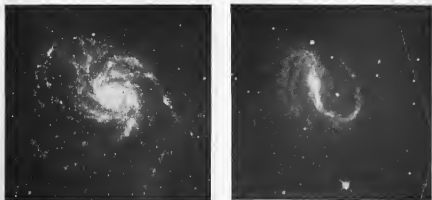
*Attributed to L. F. Richardson, a meteorologist.

THE END

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Fig. 5. The most recent cosmological theories indicate that the size of the extra-galactic nebulae may have been determined originally by the struggle between the forces of turbulence and the forces which caused the expansion of the universe.





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